

AIRCRAFT ACCIDENT
IDENTIFICATION
NO.

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NASOM for info 24

Op-301Z/mrb
Ser 6624P30

Close

APR 18 1955

SECOND ENDORSEMENT on Op-57 memo of 25 Jan 1955

From: OP-30
To: OP-57

Subj: Report of independent investigation of major aircraft accident involving R7V-1 Bu. No. 128441 on 31 October 1954.

1. Returned.
2. Voice is used by all known U.S. government and commercial agencies for trans-ocean reporting in air traffic control. This also holds true for the majority of international air routes. Hence, though CW is superior in point of reliability and range, voice is proven adequate in these respects. Therefore, in view of the other advantages of voice radio, it is recommended that voice be considered the primary means for long distance air/ground communications for Navy transport aircraft, with CW back-up where required.
3. With regard to the specific recommendation in paragraph 3.b. of the basic report, air-to-ground circuits are guarded by Naval Air activities; hence implementation of the cited recommendation is within the cognizance of the DCNO (Air).

G. I. CASWELL
Captain, U.S. Navy
Assistant Director, Naval Communications
By direction

Copy to:
OP-55)
OP-53)

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Op-555D1/das
Ser 8P555

14 MAR 1955

MEMORANDUM

FIRST ENDORSEMENT on OP-57 memorandum of 25 Jan 1955

From: Op-55
To: Op-30

Subj: Report of independent investigation of major aircraft accident involving R7V-1 Bu. No. 128441 on 31 October 1954.

1. Relative to paragraph 2c and 3b of the basic report it is submitted that the trend toward the exclusive use of voice radio for trans ocean position reporting is more than a trend. Voice reporting has proved to be expeditious despite static and crowded voice circuits providing the proper equipment is employed. Modern voice equipment and alternate channelization are considered superior approaches to trans ocean reporting rather than retrogressing to CW communications as suggested in paragraph 3b.

Paul H. Ramsey
Rear Admiral, U. S. Navy

Copy to:
Op-53

2

COPY

14/30

Op-572/mvd
11 March 1955

12-9
JFM

MEMORANDUM

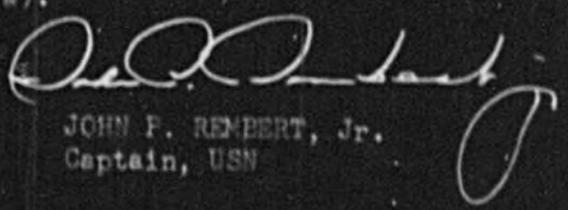
To: Officer-in-Charge, U. S. Naval Aviation Safety Activity,
Naval Air Station, Norfolk 11, Virginia

Subj: Aircraft Accident; report of

Ref: (a) CNO msg 282107Z Feb 1955

Encl: (1) VR-1 AAR ser 4-54 concerning R7V-1 EUNO 128441 accident
occurring 30 Oct 1954

1. Enclosure (1) is forwarded herewith for retention.
2. All recommendations contained in the basic correspondence, and endorsements thereto, are based on material deficiencies and it is considered that adequate action has been initiated by the Bureau of Aeronautics to correct those problems. Action taken by the Chief of Naval Operations in regard to the grounding and/or restricting recommendations is contained in reference (a).


JOHN F. REMBERT, Jr.
Captain, USN

UNITED STATES ATLANTIC FLEET
FLEET LOGISTIC AIR WING, ATLANTIC/CONTINENTAL
U. S. Naval Air Station
Patuxent River, Maryland

OO/HRN:da/A25-1
Ser 111

JAN 21 1955

From: Commander, Fleet Logistic Air Wing, Atlantic/Continental
To: Commander Air Force, U.S. Atlantic Fleet

Subj: COMAIRLANT Third Endorsement serial 479 dtd 18 Jan 55 on
VR-1 AAR ser 4-54 concerning R7V-1, BuNo 128141 accident
occurring 30-31 October 1954; additional information

1. All Air Transport Squadron One R7V-1 aircraft have received a comprehensive fuel tank sealant examination and undergone extensive resealant at Patuxent River. The examination and resealing was carried out in conjunction with highly qualified contractor personnel. It embodied the training of enlisted personnel in the specific intricacies of integral fuel tank inspection and resealant. At present it appears that the previous excessive integral gas tank leakage has been reduced to such a degree that it is operationally acceptable. It is recommended that any decision regarding an inspection and/or reseal of gas tanks of all Air Transport Squadron One R7V-1 aircraft at the contractor's plant be held in abeyance.

2. A preliminary investigation of evidence and information available in the area of the crash of R7V-1, BuNo 131639 by the Commanding Officer of Air Transport Squadron One and officers of the Commander, Fleet Logistic Air Wing, Atlantic/Continental staff indicates that fuel tank leakage is in no way a contributing factor. It is recommended that the restriction stipulated in paragraph (3) of the subject endorsement not be binding unless the results of the investigation of the loss of R7V-1, BuNo 131639 indicate other cause.

/s/ H. R. NIEMAN, JR.

Copy to:
CNO
CINCLANTFLT
CO, VR-1

Leonard
10/30/54

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for NASA

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COPY

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON 25, D.C.

IN REPLY REFER TO

Op-574/mvd
Ser 413P57
16 DEC 1954

From: Chief of Naval Operations
To: Chief, Bureau of Aeronautics

Subj: Report of Independent Investigation of Major aircraft accident
Involving R7V-1, BuNo. 128441 on 31 October 1954

Encl: (1) Copy of subject report

1. Enclosure (1) is forwarded for information and action deemed appropriate on the recommendation contained in paragraph 3.a. therein.
2. It is requested that the Chief of Naval Operations (Op-57) be provided with a brief resume of any action taken as a result of the subject report with an information copy to the U.S. Naval Aviation Safety Activity, NAS, Norfolk, Virginia.

JOHN. P. REMBERT, Jr.
By direction

Copy to:
OP-55(w/encl (1))
NAVAVSAFACTY

5

R7V-1
Leonard
31 ed

COPY

Op-574/mvd
15 Dec 1954

MEMORANDUM

To : CP-53

From : CP-57

Subject: Report of Independent Investigation of Major Aircraft accident
Involving R7V-1, BuNo 128441 on 31 October 1954

Encl: (1) Two (2) copies of subject report

1. Enclosure (1) is forwarded for information and action deemed appropriate on the recommendation contained in paragraph 3.b. therein, which is believed to be under the cognizance of Op-53.
2. The operating commands are being addressed separately (copy to Op-53) relative to that part of recommendation 3.b. which requires action by operational activities.
3. It is requested that this office be informed of any action taken as a result of the subject report.

JOHN P. REMBERT, Jr.
Captain, USN

6

R7V-1

Leonard

31 ad

HACA/04/cjs.

REPORT OF INDEPENDENT INVESTIGATION
OF
MAJOR AIRCRAFT ACCIDENT INVOLVING
R7V-1 BUONO. 128441 * AT SEA ON THE
GREAT CIRCLE ROUTE BETWEEN SHAD
INTERSECTION (LAT 37-43N; LONG 73-00)
AND LAJES AIRPORT, THE AZORES ON
31 OCTOBER 1954

7

R7V-1

LEONARD

31 Oct 54

REPORT OF INDEPENDENT INVESTIGATION OF MAJOR AIRCRAFT ACCIDENT INVOLVING
LT John G. LEONARD (b) (6) USN IN R7V-1 BUNO 128441 AT SEA ON THE
GREAT CIRCLE ROUTE BETWEEN SHAD INTERSECTION (LAT 37-40N; LONG 73-00W)
AND LAJES AIRPORT, THE AZORES ON 31 OCTOBER 1954

THE ACCIDENT

1. R7V-1 BUNO 128441 assigned to AIR TRANSPORT SQUADRON ONE (VR-1) was reported missing and presumed lost at sea at 0815 EST on 31 October 1954 while on a regularly scheduled flight from NAS Patuxent River, Maryland to Lajes Airport, the Azores. The planned route for the flight was the great circle course between Shad Intersection (LAT 37-40N; LONG 73-00W) and Lajes Airport, the Azores. There were forty-two (42) persons on board the aircraft at the time of the accident and all are missing and presumed lost at sea. There was no damage to private property as a result of this accident. The mission of the flight was regularly-scheduled Fleet Logistic Support.

CONCLUSIONS

2. It is concluded that:

- a. The primary cause of this accident is undetermined. (See paragraph (6).
- b. An explosive mixture of air and vaporized or atomized hydraulic fluid can be inducted into the R7V-1 cabin through the cabin pressurization system. (See paragraph 13)

c. The current trend toward exclusive use of voice radio for trans-ocean position reporting has resulted in deterioration of CW air-to-ground communication systems and procedures. (See paragraphs 29 and 30)

RECOMMENDATIONS

3. It is recommended that:

a. Drain troughs be placed under the hydraulic lines and equipment located in the areas of the intake ducts of the cabin pressurization system of R7V-1 type aircraft to drain leaking hydraulic fluid away from the intake ducts and surrounding areas.

b. Naval Communication Stations concerned with CW Air to Ground circuits for overseas flights and Fleet Logistics Air Wings re-emphasize to all personnel concerned the importance of maintaining continuous and careful listening watches at both the ground and the airborne stations on published CW Air to Ground frequencies to insure that Naval CW circuits are available at all times to Naval air transport flights as a stand-by means of making required position reports.

HISTORY OF FLIGHT

4. At 2139 EST on 30 October 1954 LT J. G. LEONARD (b) (6) USN took off for Lajes Airport, the Azores in R7V-1 BuNo. 128441 from NAS Patuxent River, Maryland. The flight was normal in all respects until 2330 EST 30 October 1954, at which time a position report was received from this flight. This report gave the 2303 EST position of the flight as LAT 38-06N; LONG 69-12W. No further reports were received from this flight. At 0315 EST 31 October 1954, New York Oceanic Area Control declared this flight in distress and Search and Rescue procedures were initiated.

Extensive search by air and surface craft failed to locate any trace of this aircraft or the occupants of the aircraft.

INVESTIGATION AND ANALYSIS

5. The aircraft Accident Investigator for the Naval Aviation Safety Activity arrived at VR-1 Offices at NAS Patuxent River, Maryland at 1300 on 1 November to conduct an independent investigation of this aircraft accident.

6. The absence of survivors and the total lack of wreckage in this case necessarily limited the accident investigation to records available in VR-1 files, interviews with all personnel who assisted in dispatching "441", and inspection of VR-1 aircraft available at NAS Patuxent River. These sources of information were utilized in the investigation and the most probable cause factors determined from these sources are discussed in the remaining paragraphs of this report.

PRIMARY ASSUMPTION

7. Based on the known capabilities of the crew of "441", the proven dependability of the radio equipment available to the crew, and the absence of any distress signals from "441", it was assumed that the accident occurred without warning, was violent in nature, and was beyond human ability to cope with it. In general, three types of aircraft accidents can be described in these terms. They are: (a) Mid-air collision, (b) Flash fire or explosion, and (c) Structural failure. The possibility of mid-air collision in this case was ruled out by the absence of reports on other overdue or lost aircraft on this route during this period. This left the investigators with two general areas to develop in their investigation; Flash-fire or explosion,

and Structural failure (including power plant failure).

THE FLIGHT CREW OF "441"

8. The Plane Commander, the Co-Pilot, the Navigator, and the Flight Engineer of the "441" on this flight were exceptionally well-qualified in their duties as established by interviews with the Chief Flight Inspector of VR-1, examination of training records, and examination of individual flight logs. In addition to this crew, there was a second crew on board for the purpose of flying the plane from Lajes to Port Lyautey. (LT., LEONARD's crew was scheduled to lay over at Lajes for a rest period). This second crew was in all respects as well-qualified as LT., LEONARD's crew. These facts do not rule out the possibility of error of personnel being a factor in this accident, but they do indicate that highly-trained personnel were on board in more than adequate number to cope with any controllable situations that might have developed.

ENGINES, PROPELLERS, AND ASSOCIATED EQUIPMENT

9. Engine log books, propeller log books, accessory records, maintenance records, and discrepancy sheets were examined in detail. Maintenance personnel of VR-1 were interviewed regarding the power plants of "441". These interviews and the review of the records indicated that all four engines on "441" were satisfactory in all respects, that they had no unusual items in their history, and that they were in all respects ready for and capable of completing the scheduled flight which resulted in this accident. This investigating procedure was repeated in the case of the propellers and accessories and the results of the investigation were the same as those obtained in the case of the engines.

AIRFRAME AND ASSOCIATED EQUIPMENT

10. Investigation of the airframe and associated equipment of "441" disclosed three items which could have caused this accident. The first item concerned leaks in the wing fuel tanks in the R7V. The second item concerned the possibility of excess pressure building up in the cabin due to malfunction of the cabin safety relief and dump valve. The third item concerned the possibility of introducing hydraulic fluid mist or lubricating oil mist into the cabin through the cabin pressurization ducts.
11. Concerning the possibility of fuel leaks in "441", VR-1 has a history of many small gasoline leaks in the integral fuel tanks in the wings of the R7V-1. The primary cause of these leaks is deterioration of the sealing compound used in sealing the seams and riveted joints of the tanks. This deterioration is the result of an incomplete job of sealing the sealing compound during manufacture. During manufacture, a putty-like substance is used to seal the tanks. After this substance is in place, a fluid is applied to the putty-like sealant to render it impervious to the effects of gasoline. This fluid makes the sealant retain elastic properties. In the R7V-1's assigned to VR-1, the application of this fluid to the sealant was incomplete with the result that the primary sealant was attacked by gasoline which caused it to become brittle and lose its sealing properties.
12. The frequency of discovery of fuel tank leaks in VR-1 resulted in Lockheed Aircraft Corporation sending personnel to VR-1 to effect repairs to the tanks. This consists of removing the old, brittle sealing compound,

replacing it with new compound, and then applying the sealing fluid to the new compound with spray equipment and hand brush. This repair had not been effected in "441".

13. The majority of leaks in VR-1 aircraft were around the manhold covers on the underside of the wings. All of the leaks discovered were external leaks. Detailed inspections of VR-1 aircraft during the investigation did not disclose a single instance wherein internal leaks had resulted in pooling of fuel in wing or fuselage void spaces. All wing voids are ventilated and the possibility of explosive mixtures collecting in these voids is reasonably remote but not impossible.
14. The investigation made a detailed examination of all factors involved concerning the possibility of explosion of the pressurized cabin due to excess pressure or fatigue, similar to the "Comet" disasters. Mr. W. J. CRITCHLOW, Design Engineer of the Structures Division of Lockheed Aircraft Corporation was available to the investigation during this phase and he had with him all the design considerations and specifications which went into the pressurization system on the R7V-1.
15. Design specifications provide that the pressure cabin be able to withstand a pressure differential of 7.5 psi before the yield point of the cabin structure is reached. Design rupture pressure differential is 11.35 psi. Flight tests have shown that the cabin superchargers can maintain only 7.37 psi differential at 20,000 feet altitude under optimum conditions at the superchargers. Normal leakage of pressure through access doors, around windows, and similar sealed joints, plus leakage through lavatory venturtes, provide sufficient pressure relief to avoid building

up bursting pressures in the cabin even though all regulating system relief valves malfunction in the closed position. This was proven in a flight test made by Lockheed Aircraft Corporation wherein all pressure relief valves were manually held closed at 20,000 feet. The maximum pressure obtained in this condition was 11.9 "Hg, or less than 6 psi, which is well below the yield strength of the cabin.

16. The pressure relief valves are essentially the balanced diaphragm type controlled by reduced pressure on the spring-loaded side of the diaphragm.

The emergency pressure relief valve is of this same type but it is controlled only by actual pressure differential between ambient atmospheric pressure and cabin pressure. It is set to open when this differential reaches 11.9 "Hg. This valve appears to be a rugged, simple mechanism and as fool-proof as sound engineering principals and practice can provide. The possibility of malfunction was not discounted during the investigation, but it seemed remote, and the considerations discussed in paragraph 15 above indicate that such a malfunction would not cause explosion of the cabin.

17. The possibility of structural failure of the pressure cabin due to fatigue was considered during the investigation. Fatigue failure in general involves stress concentration, degree of overstress, and type of cyclic loading. Stress concentration relief had been provided at all known critical points during the design of the cabin. The degree of overstress, if any, was slight as indicated in paragraphs 15 and 16 above. The type of loading was pneumatically applied which, while not static loading, was not shock loading. All three of these considerations were

discussed with Mr. CRITCHLOW and the possibility of fatigue failure of the pressure cabin due to pressurization cycling is considered remote.

18. On Saturday afternoon, 20 October 1954 a VR-1 training flight in an RTV-1 returned to base because of dense hydraulic "smoke" in the cabin. This "smoke" appeared when the pressurization system was placed in operation at 2,500 feet during a climb to altitude. The plane crew recognized this "smoke" as hydraulic fluid in mist or vapor form and immediately secured the pressurization system and purged the cabin with fresh outside air. Investigation of the system made subsequent to this incident revealed a severe leak in the hydraulic control valve in the starboard wing between the nacelles. Fluid from this leak had leaked through a ventilating louvre in the bottom surface of the wing. After leaving this louvre, the fluid spread over a considerable area of bottom surface of the wing. Boundary layer action carried this fluid in random directions spanwise along the wing surface and a considerable quantity had apparently been carried across the cabin supercharger intake duct opening, which is located in the bottom surface of the wing about four feet inboard of the louvre through which the fluid was leaking. The fluid entered this intake opening and was carried to the cabin pressure supercharger through the intake duct. Action of the supercharger blades atomized the fluid and this vapor or mist was carried to the cabin through the pressurization system ducting. In the proper mixture with air, this hydraulic fluid mist or vapor is more explosive than aviation gasoline in the same condition. The source of ignition required to ignite this mixture can be a lighted cigarette, a spark from a cigarette lighter, or a discharge spark across an electrical relay.

19. On several occasions "smoke" has been introduced into the R7V-1 cabin through the pressurization system as the result of failure of lubricating oil seals on the cabin supercharger. This lubricating oil mist or vapor is not explosive generally speaking, and requires a large source of intense heat for ignition. Plane crews interviewed stated that it is easy to determine the type of "smoke" that is entering the system through the distinctive odor in each case.

20. VR-1 has a standard emergency procedure that is followed when such "smoke" is detected in the cabin. All crews interviewed knew this procedure and it was established that the crew of the "441" was well trained in this procedure.

21. The considerations discussed in paragraphs 18, 19, and 20 above indicate the possibility that an explosion caused by hydraulic fluid mist or vapor could have caused this accident. This possibility is considered to be not as remote as those discussed in paragraphs 11 through 17 inclusive.

22. The aircraft involved in this accident was used to conduct the Accelerated Service Trials for R7V-1 type aircraft. These trials were conducted by VR-1 during the period 27 May 1953 through 22 December 1953. The report of these trials (C.O. VR-1 ltr FF12/VR-1/ARM:13:rrr/Fl, Ser 766 dtd 12 April 1954 to BuAer (AC-60)) stated in paragraph 32:

"From the results of the service trials conducted on the R7V-1 aircraft BuNo 128441, it is concluded that:

- a. The R7V-1 aircraft is unsatisfactory but acceptable for service use.
- b. The R3350-34 engine as installed in the R7V-1 aircraft requires excessive maintenance.

- c. That the discrepancies noted in this report are excessive, undesirable, and in some instances render the aircraft marginal from a safety standpoint".

Paragraph 35 of this report stated: "It should be noted that action has already been initiated by the Chief of the Bureau of Aeronautics and by the Lockheed Aircraft Corporation to correct a number of the deficiencies reported herein." In an interview with CAPT C. F. GARRISON, Commanding Officer of VR-1 it was determined that these remarks in the report referred to the large number of individual discrepancies, which taken singly, would not justify these conclusions, but which, considered in the aggregate, did justify the conclusions. The action which was initiated by the Bureau of Aeronautics and the Lockheed Aircraft Corporation in correction of the discrepancies listed in the report apparently rendered the R7V-1 suitable for military air transport operations.

23. The aircraft involved in this accident was configured for evaluation testing of three items at the time of the accident. The automatic spark advance mechanism of number 2 and number 3 engines was "locked out" on 1 October 1954. These engines were in this condition at the time of the accident. No adverse effect due to this "lock-out" was noted during the evaluation. A Grimes, rotating beacon was installed for evaluation, and Grimes Instrument panel lights were installed for evaluation at the time of the accident. The possibility that these items were cause factors in this accident is considered remote.

THE WEATHER

24. A copy of the weather forecast and cross-section that was prepared for the pilot of the "441" was compared with the forecast and cross-section

prepared for the pilot of the west-bound flight from Lajes. (This flight was airborne and heard the last report from "441" and was scheduled to pass "441" about mid-route.) Both forecasts and cross-sections agreed closely and indicated a cold front and a warm front enroute. The cold front was located at about 63° W Longitude and the warm front was located at 58° W Longitude along the track. The cold front was indicated to be more severe, but the tops of the clouds were shown as not more than 20,000 feet.

25. The west-bound flight came through both fronts at an altitude of 14,000 feet and experienced only mild turbulence. The pilot of this flight expressed the opinion that a flight at 17,000 feet would have been on top of the weather in both fronts, except for cloud tops.

26. The experience of the west-bound flight does not prove that the "441" encountered the same weather, or that the "441" did not encounter severe turbulence during transit of either front, but it does indicate that the actual weather along the planned track of the "441" was as forecast and did not contain dangerous conditions. The possibility of structural failure during transit of frontal weather cannot be discounted in this accident, but this possibility appears remote.

ELECTRONIC EQUIPMENT AND PROCEDURES

27. Communication equipment. The R7V-1 type aircraft is equipped with three (3) transmitters. They are; (a) The ART-13 LF-MF-HF auto-tune CW-Voice 90 Watt transmitter, (b) The ARC-27 UHF Voice Trans-ceiver, and the ARC-1 VHF Trans-ceiver.

The ARC-27 is the only one of these that can be considered as modern equipment. The ARC-1 requires the addition of a second stack of crystals to adapt

16. to the requirements of Continental U.S. and overseas operations. The ART-13 transmitter does not "load" properly to the antenna length available on R7V-1 aircraft and requires a large antenna loading coil between the transmitter and the antenna. The ART-13 equipment has had a long service life and the auto-tune components have been subjected to excessive wear. These considerations, plus the fact that the ART-13 design output power was only 90 watts CW and approximately 50 watts voice, indicate that this transmitter is outmoded for transcontinental and overseas military air transport operations. However, replacement transmitters more suitable for this purpose are not available.

28. The R7V-1 is equipped with six (6) receivers. They are: (a) the receiver section of the ARC-27, (b) The receiver section of the ARC-1, (c) The EC-348 LF-MF-HF receiver, (d) The ARC-5 low-frequency radio range receiver, and (e) Two (2) ADF receivers. The EC-348 is the primary receiver for communicating with Ocean Area Control centers and is considered an excellent receiver in all respects.

29. Ocean Area Control procedures require hourly position reports from aircraft enroute. Page 80 of "RADIO FACILITY CHARTS and in-flight data NORTH ATLANTIC AND EAST CANADA" dated 1 August 1954 encourages USAF operators to use voice radio in making these reports. VR-1 pilots are currently using voice radio in making these reports to determine the feasibility of using voice radio exclusively on North Atlantic crossings. The International Civil Airways Organization (ICAO) is reportedly interested in requiring exclusive use of voice radio in making these reports. (The Naval Aviation Safety Activity does not have data in substantiation of this.) VR-1 pilots report difficulty in getting required reports off at scheduled report times, and

difficulty in making reports due to crowded voice circuits, weather-caused static interference, and unexplained difficulty in establishing contact with ground stations. When these difficulties are experienced using voice radio, VR-1 pilots shift to CW radio and attempt to get their reports out in this manner. These pilots report difficulty in raising both Ocean Area Control stations and U.S. Navy stations on published CW circuits.

30. This background of difficulties indicates the desirability of exclusive use of CW circuits in making these reports. It further indicates the desirability of continuous CW watches on published frequencies by the U.S. Navy stations on or near FlogWing overseas routes as a secondary means of position reporting when Ocean Area Control circuits are overcrowded. VR-1 pilots report poor results in all cases when attempts are made to raise U.S. Navy stations on CW circuits. This could be due to poor equipment or operating techniques in the aircraft or the station being called.

31. The R7V-1 is equipped with APS-42 Navigation radar equipment. VR-1 pilots use this equipment to locate thunderheads when transiting frontal weather. These pilots report that this equipment is satisfactory for this purpose when the equipment is operating properly. They also report that the reliability of this equipment is satisfactory.

32. The pilot in command of this flight (Plane Commander), LT John G. LEONARD (b) (6) USN was designated a Naval Aviator on 24 October 1944. He was 32 years old. He had a total of 5107.3 hours of aircraft pilot time, of which 711.5 hours were in R7V-1 type aircraft. In the past three months he had flown a total of 200.5 hours of which 23.1 hours were on instruments and 19.9 hours were at night. He possessed a valid instrument rating in R7V-1 type aircraft dated 26 May 1954 expiring 26 May 1955.

33. There was no damage to private property as a result of this accident.

34. The following data pertaining to this investigation is on file at the U.S. Naval Aviation Safety Activity, NAS Norfolk, Virginia, and can be obtained on request:

- a. Investigator's Narrative
- b. Press Reports
- c. List of Manufacturers Representatives Participating in the Investigation
- d. Crew and Passenger List
- e. Weather Data
- f. AirLant Tech Letter No. 3 ATL-54
- g. Transcript of Tower Recording of Clearance of "441"
- h. Report of Accelerated Service Trials on R7V-1
- i. Photograph
- j. Crew Qualification Records
- k. Cargo Manifest
- l. Records of Previous Discrepancies on "441"
- m. Photostats of Airframe Log Book Entries
- n. Complete History of "441"
- o. Documents Concerning R7V-1 Fuel Leaks
- p. Maintenance Release Sheets
- q. Weight and Balance Computation and Associated Documents
- r. Brief Description of R7V-1 Type Aircraft and Equipment
- s. Orders Directing the Investigation
- t. Summary of SAR Operations

FFL-2/A4-3

527 /33

14 FEB 1955

RECEIVED
NAVY DEPARTMENT
OPNAV CENTRAL MAIL ROOM
16 FEB 1955

FOURTH ENDORSEMENT on VR-1 AAR ser 4-54 concerning R7V-1 BUNO 128441
accident occurring 30 Oct 1954

From: Commander in Chief U.S. Atlantic Fleet
To: Chief of Naval Operations

Subj: Aircraft Accident; report of

Ref: (b) COMFLOGWINGLANT/CONTL 270143Z JAN 1955



Reg. No. _____
Copy No. _____

1. Forwarded.

2. In paragraph 3 of the third endorsement COMAIRLANT recommended "that R7V-1 operations in VR-1 be restricted to overland cargo flights only, except when military necessity requires over-water flights".

3. Subsequent to the preparation of the third endorsement and as a result of the preliminary investigation being conducted in connection with the loss of R7V-1 BUNO 131639 out of Harmon AFB on 17 January 1955, COMFLOGWINGLANT, by reference (b), recommended that the R7V-1 be grounded except for training and maintenance flights. This recommendation was based on the best available opinions as to the most likely cause or causes of the loss of R7V-1 BUNO 131639. CINCLANTFLT passed this message to CNO and concurred with COMFLOGWINGLANT.

4. In view of the foregoing, CINCLANTFLT does not concur in the recommendations in paragraph 3 and 4b of COMAIRLANT endorsement.

5. Neither the Court of Inquiry convened to look into this matter, nor the aircraft accident board have determined the cause of this accident. In the investigation by both of these bodies the material and operational characteristics have been exhaustively examined and many discrepancies pointed out. In view of the above, coupled with the recent R7V loss on 17 January, CINCLANTFLT considers that until the recommendations in reference (b) and in paragraph 4c and 4d, of COMAIRLANT endorsement have been thoroughly evaluated by CNO, and guidance provided, that the R7V-1 should continue to be grounded except for training and maintenance flights.


S. H. INGERSOLL
Chief of Staff

Copy to:
OO VR-1
COMAIRLANT
COMFLOGWINGLANT/CONTL

22

6022

HEADQUARTERS
COMMANDER AIR FORCE, U. S. ATLANTIC FLEET
U. S. NAVAL AIR STATION
NORFOLK 11, VIRGINIA

REFER TO
FF4-2/A9-8/3

SERIAL

701/ 479

18 JAN 1955

THIRD ENDORSEMENT on VR-1 AAR ser 4-54 concerning R7V-1, BuNo. 128441
accident occurring 30-31 October 1954

From: Commander Air Force, U. S. Atlantic Fleet
To: Chief of Naval Operations (OP-53)
Via: Commander in Chief, U. S. Atlantic Fleet

Subj: Aircraft Accident; report of

1. Forwarded.
2. This endorsement takes into consideration
 - a. The record of the proceedings of the Court of Inquiry in this accident, which was not available either to the Aircraft Accident Board or previous endorsers, and
 - b. The information available to date concerning the loss of R7V-1, BuNo. 131639 on 17 January 1955, which occurred subsequent to second endorsement.
3. In view of
 - a. The fact that three R7V-1 losses have occurred in Air Transport Squadron One,
 - b. The fact that there have not been any other Navy losses of R7V-1 aircraft,
 - c. The fact that there have not been any similar accidents in the commercial versions of the R7V-1 aircraft,
 - d. The fact that all R7V-1 aircraft and commercial versions are generally equivalent materialwise save for minor differences in engine configuration due to earlier incorporation of miscellaneous changes in commercial aircraft and appreciable differences in electronic configuration, and,
 - e. The fact that there is a good possibility that the majority of VR-1 aircraft integral gas tanks were sealed improperly due to poor quality control at the start of R7V-1 production,

it is recommended that R7V-1 operations in VR-1 be restricted to overland cargo flights only except when military necessity requires overwater flights.

HEADQUARTERS
COMMANDER AIR FORCE, U. S. ATLANTIC FLEET
U. S. NAVAL AIR STATION
NORFOLK 11, VIRGINIA

REFER TO
FF4-2/_A9--8/3
SERIAL

701/

479

18 JAN 1955

4. It is further recommended that

a. All VR-1 R7V aircraft receive a comprehensive fuel tank sealant examination at the contractor's plant and all tanks showing evidence or having a history of leaks or excessive seepage be completely stripped and re-sealed.

b. The restriction recommended in paragraph 3 above remain in effect until the foregoing examination and re-seal is accomplished provided the results of the investigation of the loss of R7V-1, BuNo.131639 do not indicate otherwise.

c. A study be conducted of the procurement policies, heavy maintenance policies, the schedule of incorporation of aircraft and engine changes, and maintenance and operating procedures to determine the adequacy of the existing policies.

d. A high priority project be established to investigate the adequacy of the R7V-1 electronic configuration (communication equipment, navigation aids) as compared to the configurations existing in commercial versions of the R7V-1 operating on transoceanic routes.

E. W. McMAHON

Copy to:
COMFLOGWINGSLANT/CONTL
CO, VR-1

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A25
5

FF12/FLogWingLant/Contl
O4:HRN:hk/A9-8/3
Serial: 1104

30 DEC 1954

SECOND ENDORSEMENT on VR-1 AAR ser 4-54 concerning R7V-1, BuNo. 128441
accident occurring 30-31 October 1954

From: Commander, Fleet Logistic Air Wing, Atlantic/Continental
To: Chief of Naval Operations (Op-53)
Via: (1) Commander Air Force, U.S. Atlantic Fleet
(2) Commander in Chief, U.S. Atlantic Fleet

Subj: Aircraft Accident; report of

Ref: (a) Record of Proceedings of a Board of Investigation convened to
investigate the crash of R7V-1, BuNo. 128440 and ComFLogWingLant/
Contl 2nd end. thereto dated 30 Sep 1953

1. Forwarded. A number of the statements contained in the first endorse-
ment cannot be substantiated and are questionable.

2. Commander, Fleet Logistic Air Wing, Atlantic/Continental concludes that
the cause of this accident is undetermined. It is considered most probable
that R7V-1, bureau number 128441 met with a sudden and violent force that
destroyed the aircraft.

3. Commander, Fleet Logistic Air Wing, Atlantic/Continental does not
concur with paragraph 33. a. (2) of the Aircraft Accident Report since the
conclusions of the Accelerated Service Trials Report (enclosure 26) and
first endorsement thereto are misrepresented in this section of the Board's
report, as follows:

a. In concurring with conclusions reached in the Accelerated Service
Trials the Board states "The R7V-1 is unsatisfactory. It is not acceptable
for the world-wide operations required by the Navy." The conclusions of
the Accelerated Service Trials actually stated, "The R7V-1 aircraft is
unsatisfactory but acceptable for service use." Commander, Fleet Logistic
Air Wing, Atlantic/Continental forwarding endorsement on the Accelerated
Service Trials Report, in enumerating several of the discrepancies and
deficiencies, stated that, "Because of these, the aircraft cannot be
considered completely satisfactory operationally." This endorsement did
state, however, that "The R7V-1 airframe and turbo-compound engine combination
is basically very satisfactory and desirable for its military transport
mission and is a decided improvement over previous transport models."

4. On 7 July 1953, R7V-1, bureau number 128440 suffered strike damage in
a crash near Chestertown, Maryland. Reference (a) pointed out the fact

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FF12/FlogWingLant/Cont1
O4:ERN:hk/A9-8/3
Serial:

that the quality control exercised by the Lockheed Aircraft Corporation was considered to be below the standards necessary to insure protection against inferior products and recommended that the contractor practice more stringent control and better inspection procedures to insure a better end product. Since the writing of that endorsement, there have been additional indications that the airframe has failed to meet the high standards required in the quality of workmanship. There has been a never ending siege of discrepancies and failures which have caused innumerable "crash" programs to correct. A number of these involved safety of flight. This has imposed a serious overload of maintenance work on the squadron and has reduced its operational efficiency and capability.

5. Since the R7V-1 aircraft was first received by Air Transport Squadron One, every important discrepancy, deficiency and failure has been brought to the attention of the Bureau of Aeronautics, BAR Burbank, BAR Wood-Ridge, and other cognizant naval authorities by dispatch, letter, unsatisfactory reports and conferences. In addition numerous conferences have been held with representatives of Lockheed Aircraft Corporation, Wright Aeronautical Corporation and the Bureau of Aeronautics. Corrective or investigative action has been initiated on the major portion of these items, however, the process is a lengthy one and many months of negotiation ensue before any resultant action is evidenced in the operational aircraft. THIS LONG DELAY IS MOST UNSATISFACTORY AND OPERATIONALLY UNACCEPTABLE.

6. The R7V-1 aircraft has not received timely, adequate maintenance and material support. All programming is so far in the future that it is deemed pitiful. Continued operation, as untimely and poorly supported as at present, will only breed more serious operational difficulties.

7. It is recommended that the Chief of Naval Operations direct responsible naval authorities to provide R7V-1 aircraft support, sufficient and timely, to accommodate Fleet Logistic Air Wing operations on a par with that accorded combatant aircraft.

8. Based on the foregoing, Commander, Fleet Logistic Air Wing, Atlantic/Continental considers that the employment of these aircraft in their present assignment should continue. //

H. R. Kuman, Jr.

H. R. Kuman, Jr.

Copy to:
CO, VR-1

277
4 DEC 1954

FIRST ENDORSEMENT on VR-1 AAR ser 4-54 concerning WTV-1, 128441, accident occurring 30/31 Oct 1954.

From: Commanding Officer, Air Transport Squadron One
To: Chief of Naval Operations (Op-53)
Via: (1) Commander, Fleet Logistic Air Wing, Atlantic/Continental
(2) Commander Air Force, U.S. Atlantic Fleet
(3) Commander in Chief, U.S. Atlantic Fleet

Subj: Aircraft accident; report of

1. Comments on the conclusions of the Aircraft Accident Board are submitted as follows:

a. Concur that a sudden, violent, unknown, force rendered the aircraft uncontrollable. It is not considered that the abstract label "isolated case" can be applied to this accident because of the implied reasoning that sufficient knowledge of the cause is available to some responsible person to lead to a conclusion that the cause or combination of causes is so rare and duplication so improbable that recurrence is extremely unlikely. No such knowledge exists. It has been established that whatever happened to the aircraft happened in spite of all prescribed maintenance procedures, operating procedures, and safety precautions. Therefore the squadron is not currently in a position to guarantee that there will not be recurrence.

b. Since the Board reached a conclusion that the aircraft was, in general, unsatisfactory, without being able to relate specifically any known deficiency with the most probable cause of this accident, some further discussion of unsatisfactory components appears to be in order. There are known design and engineering deficiencies in this aircraft which render it unsuitable and unreliable as a passenger-carrying transport. In addition, there is an unknown cause of susceptibility to violent destruction in flight. Because the accident resulted in a totally missing aircraft, no one of the known defects can be advanced as the most probable cause of the accident. However, when any one aircraft incorporates so many known deficiencies, any combination of the possible failures leads to a mathematical multiplication into a probable failure in flight.

c. In connection with the Accelerated Service Test conducted by VR-1 and ComFlog/WingLant/Contl first endorsement thereon, dated 12 April 1954 and 10 May 1954 respectively (enclosure 26 of the AAR) it should be noted carefully that both documents described this aircraft as "unsatisfactory", and "marginal from a safety standpoint" in many respects. It is believed that the reports refrained from declaring the aircraft unsafe and unusable only because there was reason to believe that corrective action would follow expeditiously, and this was made an implied condition to the feasibility of continued operation. Whereas some corrective action has been initiated, remedies for the major discrepancies have not reached the operating aircraft six months after the report was submitted, and, in addition, the factor of

aggravated fuel tank leaks has introduced a prohibitive safety of flight consideration, which forced the grounding of aircraft until repairs. It is also believed that at the time the report was submitted the unreliability and prohibitive maintenance problems associated with the various systems and components was not yet fully apparent.

d. Only the major, outstanding, possible safety of flight items are discussed very briefly.

(1) Power Plant. The Wright R3350-34 is notoriously unreliable, and has contributed directly to heavy loss of life in service aircraft. It is widely used in naval aircraft and has developed a consistent history of unreliability and failure in flight since it was introduced in 1949. It incorporates a Power Recovery Turbine which is so hopeless a piece of machinery that, after several disastrous incidents, it was redesigned to fail, and an armor plated cover provided in anticipation of such failure. In a twelve months period VR-1 experienced 413 turbine failures among 144 installed. Why the Navy persists over a period of five years in equipping service aircraft with this engine without requiring the manufacturer to produce a reliable product is not understood. To the writer's knowledge there is no effective immediate remedy for the unreliability of this engine in sight, and no substitute engine for the R7V-1 available.

(2) Communication and Navigational Aids. The installation of the navigational aids and communications equipment, particularly the former, in the R7V-1 is disgraceful. To the writer's knowledge, the chief and only real obstacle to procuring and installing adequate equipment is budgetary and allocation considerations in a period of austerity. If this is true, then the continued operation of this aircraft with this equipment can be compared to a requirement that the Naval service use obsolete, inferior ammunition with known defects because budgetary considerations legislate against replacement.

(a) Communications Equipment. The equipment in the R7V is government furnished and peculiar in its installation to this aircraft. The installation and wiring in the R7V-1 is labelled flatly unsatisfactory in a classified report submitted by Electronics Test, U.S. Naval Test Center, Patuxent River. For a further discussion of the communication installation, see enclosure (26) to the AAR.

(b) Navigational Aid Equipment. This installation of obsolete ADF and low range frequency receiver in this aircraft render the aircraft unsafe for instrument flying. Either of the equipments mentioned are completely useless in the presence of external static, either atmospheric or precipitation; yet this aircraft is committed to global schedules under all weather conditions. The fact that no serious accidents have resulted thus far from this circumstance should be attributed to the high degree of skill, resourcefulness, and good fortune of the pilots, and is in no sense a justification for continued operation under hazardous conditions. It serves no purpose

to compare the success or failure of the same basic equipments in other aircraft; the fact remains that, as installed in the A7V-1, with the existing antenna arrangement, the aircraft should be restricted to VFR conditions, or very favorable IFR conditions.

(c) Radar. The APS-42 radar (again, as installed in this aircraft), is unsatisfactory in performance and hopelessly unreliable. An effective, thoroughly reliable radar is considered essential to high-speed transport operations through frontal weather. The inability of this experienced pilot to circumnavigate or penetrate discretely in darkness an area of heavy turbulence associated with a frontal system because the plane's radar was not working properly, or not working at all, remains a possible cause of this accident.

(3) Gas Tank Integrity. Unknown at the time of the Accelerated Service Test is the completely unsatisfactory condition of the gas tanks, as delivered by the manufacturer and accepted by the Navy, which subsequently gave rise to an aggravated condition of leaking, and which remains as a possible cause, among others, of this accident. It has been definitely determined that this condition resulted from poor workmanship, supervision, and inspection at the factory. If any conclusion is drawn from the condition of the gas tanks in the A7V-1 as delivered, then the inspection and quality controls generally employed under the Navy contract must be considered seriously compromised, and all of the aircraft systems become suspect.

(4) Hydraulic System. The hydraulic system referred to in the report is of obsolete design; unnecessarily complicated, unreliable, and unduly difficult to maintain. Its functions can affect safety of flight in any one of several aspects but it is not necessarily directly related to a possible cause of this accident.

2. Recommendations.

a. Other than to corroborate the deficiencies developed by A7V-1 in operating the aircraft for over one year, it is not considered that a very useful purpose would be served by subjecting an A7V-1 to a complete service test by the Naval Air Test Center. It is considered that the deficiencies exist now in a form sufficiently factual and well defined, without a necessity for expert testers to lend authority to such findings. Furthermore such an approach might lead to a corollary requirement that the squadron continue to operate the aircraft in its present condition pending the results of such a test which probably would not be published for six to eight months. In order to correct the electronic installation and antenna arrangement it may be necessary for Electronics Test of the Naval Test Center to prototype a model, and evaluate the resulting performance.

b. The second recommendation of the Board, that the aircraft be restricted to continental cargo flights, is not concurred in, for the following reasons:

(1) If the aircraft must be considered to be susceptible to sudden, violent, disruption of flight then it should not be operated at all. There

is not available at this time sufficient evidence to ensure the degree of susceptibility, but a fraction of some or all of the known causes cannot be shown to have a direct and positive effect on removing this susceptibility; therefore, the recommended restriction becomes optional rather than logical.

(a) The Board predicated the removal of such restriction on the positive solution of the gas leak and electronic problems.

(A) The gas leak problem is currently being treated as a separate project, with extensive stripping of the interior surface and application of new sealant. The results of this program is not yet known as a positive determination as to its effectiveness in reducing leaks to an acceptable safe minimum. There is reason to hope that the process will be successful, if the leaks are not effectively stopped there is no alternative but to return all aircraft to the factory for removal of wings and a complete resealing job.

(B) A positive solution to the "electronic" problems, including the provision of modern, reliable, communication equipment, navigational aids, and power may well be a gradual process, with the overall condition being partially remedied in phases. This would not lead to a clearance, sensible time, for lifting the restriction. Furthermore, the electronic deficiencies can result in fairly hazardous conditions in continental flights, alleviated only by the general prevalence of ground equipment, such as GMDR radar and ILS which are not subject to the same degree of atmospheric static distortion and more complete weather forecasting, which are not available in Europe or the Caribbean.

(c) The third recommendation of the Board, that the investigation continue, is strongly encouraged in, and amplified by the recommendation that the proceedings of the Court of Inquiry be closely examined for any further clues as to the cause.

(d) Further recommendations of the Commanding Officer follow:

1. Power Plants. Every effort should be made to research and incorporate changes in the Navy R3350-3A engine on an urgent basis which will lead to greater reliability. Use of this engine in its present condition is extremely uneconomical, and reflects seriously on the operational readiness of fleet units other than Vt-1. The rate of failure in flight is so high that even with four-engine aircraft, there is an unmeasurable mathematical probability that sooner or later an accident will result from multiple failure on the same aircraft.

2. Electronic Equipment (Communication, Navigation, etc.) A series of letters initiated by ComFleetMent/Com1, in addition to the endorsement on the accelerated Service Trials previously referred to, make specific recommendations for improved equipment and installation in the R7V-1.

AIRCRAFT ACCIDENT REPORT

OPRAY FORM-3750-1 (REV. 3-52)

PAGE 1 OF 12 PAGES

OPRAY REPORT-3750-1

THE AIRCRAFT ACCIDENT BOARD SHALL SUBMIT THIS REPORT TO THE C.O. OF THE ACTIVITY CONDUCTING THE INVESTIGATION. IT SHALL THEN BE FORWARDED BY THE C.O. IN ACCORDANCE WITH CURRENT AAR INSTRUCTIONS.

1. DATE OF ACCIDENT: 30 Oct 1954
 2. ACTIVITY SUBMITTING REPORT: Air Transport Squadron One
 3. AAR SERIAL NO.: 4-54
 4. MODEL, A/C: R7V-1
 5. REG. NO.: 128441
 6. REPORTING OFFICER: Air Transport Squadron One
 7. BASE OF UNIT OPERATING THE A/C: Air Transport Squadron One, NAS Patuxent River, Md.
 8. OPERATIONAL TITLE OF COMMANDER: Comflogwinglant/Contl Comairlant
 9. LOCATION OF ACCIDENT: 38-06N
 10. DATE AND TIME OF ACCIDENT: Last Reported Position 69-12W at 30/2330 EST
 11. PERSONNEL INVOLVED: Air Transport Squadron One

See Page 2 for Crew Information.

See Page 3 for Passenger Information.

All items left blank below are unknown.

19. PILOT EXPERIENCE	TOTAL ALL MODELS	TOTAL THIS MODEL	LAST 12 MONTHS ALL MODELS	LAST 3 MONTHS ALL MODELS	LAST 3 MONTHS THIS MODEL	INSTRUMENT RATING
TOTAL HOURS	5107.3	711.5	682.2	200.5	200.5	Special/No
INSTRUMENT HOURS			133.2	23.1	23.1	PILOT'S AGE
NIGHT HOURS			183.4	19.9	19.9	32
CY LANDINGS DAY/NITE						DATE DESIGNATED
						10-24-44

11. CHECK IF: INCIDENT TO FLIGHT NOT INCIDENT TO FLIGHT
 12. PURPOSE OF FLIGHT: Scheduled Fleet Logistic Air Trans-3R1
 13. CODE: 3R1
 14. TYPE OF ACCIDENT: Undetermined
 15. FLIGHT ENROUTE TO LAJES
 16. WEATHER: Intermittent
 17. VISIBILITY: Y
 18. CLEARANCE ISSUED: IFR
 19. WIND DIRECTION, FORCE:
 20. ALTITUDE ON IMPACT:
 21. DID FIRE FOLLOW IMPACT? YES NO

22. AIRCRAFT AND ENGINE DATA (fill in all data in every case of material failure or malfunction, actual or suspected)

HISTORY	SERVICE TOUR	MONTHS IN THIS TOUR	TOTAL NUMBER OF OVERHAULS	FLT HOURS SINCE OVERHAUL	FLT HOURS SINCE ACCEPTANCE	TYPE OF CHECK LAST PERFORMED	FLT HOURS SINCE CHECK	NO. DAYS SINCE CHECK
AIRCRAFT	2nd	504.4	1	504.4	1362.4	Post Flt.	2.0	2
ENGINE 1	R-3350-34	W580113	0	0	516.3	Post Flt.	2.0	2
ENGINE 2	R-3350-34	W580110	0	0	518.2	Post Flt.	2.0	2
ENGINE 3	R-3350-34	W580111	0	0	512.2	Post Flt.	2.0	2
ENGINE 4	R-3350-34	W580112	0	0	512.9	Post Flt.	2.0	2

23. CONTRIBUTION FACTORS (check or fill in only one primary 'P' factor, all others secondary 'S')
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9. PERSONNEL INVOLVED (Including name and injury code of those injured, not occupants of A/C)

A	B	C	D	E
Full Name, Rank, Service, File No. (List person in control first)	Age	Dillet	Position	Injury
Geraldine I. HARR, LEF		Passenger	Pass Cabin	"
David R. HARR, DEF	11	"	"	"
Timothy J. HARR, DEF	6	"	"	"
Kathy A. HARR, DEF	3	"	"	"
Ida M. JACOBSEN, DEF		"	"	"
Craig A. JACOBSEN, DEF	2	"	"	"
Caryl L. JACOBSEN, DEF	2	"	"	"
Gilbert (n) JACOBSEN, LT		"	"	"
Cornelius I. COLLINS, Jr., EIS		"	"	"
Dilly J. WYNE, SA		"	"	"
Ronald I. WALKER, SA		"	"	"
James (n) WHITE, SA		"	"	"
George O. WILLINGHAM, SA		"	"	"
Leonard R. HAWTHORNE, SN		"	"	"
John E. GREGG, RMI		"	"	"
Valentino (n) MISCARELLI, DT3		"	"	"
Francis E. BAKER, DTC		"	"	"
George W. FONGONIS, CIV		"	"	"
Robert L. RIDLE, DC/AF		"	"	"
Joseph U. HEROLD, MAJ/USAF		"	"	"
Edward H. ADRIAN, MAJ/USAF		"	"	"

(b) (6)

29. The Accident. Plane Commander LT John G. LEONARD, after checking the weather, filing a form DD-175, filing a weight and balance, and receiving an ATC Clearance; departed Naval Air Station, Patuxent River, Maryland at 2139 EST, 30 October 1954, in R7V-1 BuNo 128441. The mission was a Fleet Logistic Air Wing Atlantic/Continental Planned Flight 124/30 to Naples, Italy via Lajes, Azores and NAF Port Lyautey, French Morocco. LT LEONARD was cleared at 17,000 feet on an IFR flight plan to Lajes, Azores via Salisbury, Shad Intersection, and Great Circle Route. Navy 8441 was tracked from Salisbury to Shad by Air Defense Radar. Communication was established with the Air Defense Network on UHF. At 2340 EST, Navy 8441 made a position report on HF to Aero Nautical Radio Inc., Valley Stream, Long Island. This report, which was relayed to New York (CAC), gave the aircraft's position as 38-06N and 69-12W at 0430Z. No mention was made of any difficulty during the above transmission. No further transmissions were heard from Navy 8441. An intensive search has revealed no wreckage.

30. Damage to Aircraft. Assumed to be strike damage.

31. The Investigation. An investigation was conducted by this Board with the following results:

a. Pre-Flight Forms. A form DD-175 was filed with the Operations Clearance Office, Naval Air Station, Patuxent River, Maryland. This form was signed by LT John G. LEONARD as both pilot and clearing authority. The weather cross section (enclosure (1)) was signed by (b) (6) AGC as forecaster. A weight and balance form, enclosure (2), was filed with the Fleet Logistic Terminal, Patuxent River, Maryland. This form was examined and it was found that the aircraft was well within the prescribed limits of per cent M/C (18 to 32) and the gross weight was less than 133,000 pounds, which is the maximum allowable gross take-off weight. Minor errors were found in the above weight and balance form. Mail, cargo, and passenger manifests were prepared and filed at the Fleet Logistic Terminal. These documents were examined and found to be in order.

b. Crew. The Plane Commander, LT John G. LEONARD, was a well qualified R7V-1 Plane Commander in accordance with Commander, Fleet Logistic Air Wing, Atlantic/Continental Instruction 3710.1A. Enclosures (3) and (4) set forth the background and capabilities of LT LEONARD as an aviator. He possessed a valid Special Instrument Rating and was currently qualified in Ditching and Survival in accordance with pertinent squadron directives. LT LEONARD was a designated R7V-1 Flight Instructor and was well grounded in emergency procedures. He was a qualified first navigator.

LT EDEN was a qualified R7V-1 pilot and plane commander. Enclosures (3) and (5) give the background of LT EDEN as an aviator. He possessed a valid special instrument rating and was currently qualified in Ditching and Survival. LT EDEN was a qualified first navigator.

LT MASTIKA was a qualified First Pilot and Navigator. His background as a naval aviator is set forth in enclosure (6). He was currently qualified in Ditching and Survival.

LT KLEMETTI was a qualified first pilot and navigator. He was scheduled for a final route check prior to being designated as Plane Commander. His background as a naval aviator is set forth in enclosure (7). He was currently qualified in Ditching and Survival.

FRANK T. MEIDL, ADC was a well qualified first flight engineer. His background and capabilities are set forth in enclosure (8). MEIDL was graduate of the Lockheed Flight Engineer's School at Burbank, California. He was a qualified Flight Engineer Instructor and well grounded in emergency procedures. He was currently qualified in Ditching and Survival.

EUGENE (n) HUNTLEY, ADC was a qualified First Flight Engineer. His background and capabilities are set forth in enclosure (9). He was currently qualified in Ditching and Survival.

RAYMOND R. MEYERS, A12 was a qualified First Radioman. He was currently qualified in both voice and CW type transmissions and was well grounded in emergency communication procedures. He was capable of performing in flight repairs to radio equipment. He was currently qualified in Ditching and Survival. He was qualified to operate the "Gibson Girl" transmitter carried in the aircraft.

Other crew members on board were qualified for the billet indicated on the form OPNAV 3750-1 (Rev 3-52). See enclosures (10), (11), (12), and (13). They were all currently qualified in ditching and survival. See enclosure (14). Additional crew members were carried on this flight for the purpose of establishing a new crew layover system in Lajes as required by the Commander, Fleet Logistic Air Wing, Atlantic/Continental Schedule of Planned Flights for the month of November. All members were intergraded under the command of LT John G. LEONARD. The normal crew complement of the R7V-1 is 10 to 11 crewmen.

c. Passengers. The Passenger Manifest, Next of Kin forms, and orders or leave papers were examined and found to be in order. The passengers were given a ditching and survival lecture at the Fleet Logistic Terminal prior to departing on this flight. The functions and use and location of safety belts, life jackets, life rafts, emergency exits, emergency signals, and associated equipment were explained. Passengers were manifested in accordance with current OPNAV Instructions concerning this subject.

d. Cargo and Mail. The cargo and mail were properly manifested in accordance with Commander, Fleet Logistic Air Wing, Atlantic/Continental Instructions. The locations of each item is listed in enclosure (15). Bills of lading were examined and no evidence of explosive or dangerous cargo was found. The contents of the U. S. Mail pouches are unknown.

e. The Flight. LT EDEN was in the left (pilot's) seat when the aircraft departed from the Fleet Logistic Terminal. The positions occupied by other crew members are unknown. The aircraft was cleared to Lajes as indicated by enclosure (30), a transcript of the ATC Clearance issued by NAS Patuxent Tower. After passing Salisbury, Maryland, Navy 8441 established contact on UHF with Air Defense Radar and requested a "track out" to Shad Intersection. His altitude was reported to be 17,000 feet. The aircraft was given "steers"

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to Shad. At no time did the flight indicate that any difficulty existed. The IFF showed "normal". At 2340, Navy 8441 established contact with Aero Nautical Radio Inc., Valley Stream, Long Island and gave his position as 38-06⁰⁰ and 69-12⁰⁰ and altitude as 17,000 feet at 0430Z. This report was relayed to New York (CIC). The above position information was obtained from Mr. MCRLARTY, Operations Supervisor, C.A. Regional Office, Idlewild Airport, New York City by long distance telephone. Three (3) dispatches were sent to New York (CIC) requesting transcripts of communications with Navy 8441. No answers have yet been received. Mr. MCRLARTY stated that a written report would be sent to VR-1 at some future date. He further stated that no distress message was ever received from Navy 8441.

f. The Aircraft. The investigation of the accident was broken down into component parts for ease of discussion as follows:

(1) Airplane General. Enclosure (16) gives a brief description of the aircraft in order to aid the reader of this document in identifying parts or components which will be mentioned in this discussion. Enclosure (26), a final report of the R7V-1 Accelerated Service Trials should be read in conjunction with enclosure (16).

(2) Power Plants. The logs and records of the engines and propellers were investigated and found to be in order. All required entries in these logs appear to be complete. The engines were installed by TEICO, Dallas, Texas during a routine progressive maintenance cycle. It was noted that #2 and #3 engines had the automatic spark advance locked out at 28⁰⁰ETC on 8-31-54 in accordance with ComFlog/Wing/Lant/Cont'l letter HGM:hk/F12 serial 1624 of 13 August 1954. All engines installed had less than 518.3 hours time. A history of engine discrepancies for the past two months is included in enclosure (17). The aircraft maintenance release sheet indicates no uncorrected discrepancies on any power plant of the aircraft. There is no record in the squadron that the crew located any discrepancies during the pre-flight inspection of the aircraft. However, the "carry over" log indicated that a fuel pressure transmitter for #1 engine was an order to correct a discrepancy of "fluctuating fuel pressure". The aircraft maintenance release sheet, enclosure (18), was signed by (b) (6) ADC (Inspector), (b) (6) ADC (Maintenance Duty Chief), and LT (b) (6) (Maintenance Duty Officer). The aircraft fuel loading sheet, enclosure (19), was signed by (b) (6) (n) (b) (6) AN. This sheet indicates that 6220 gallons of fuel was loaded aboard the aircraft. This fuel was 115/145 grade and was obtained from the Naval Air Station, Patuxent River fuel dumps and transported by a VR-1 fuel truck. 115/145 is the only type fuel used by this squadron. The fuel loading sheet indicates that 205 gallons of oil was aboard. The aircraft was fueled at 1935 EST, 30 October 1954. Paragraph 20 of enclosure (26) reveals that R-3350-34 engine requires excessive maintenance work and that both engine and accessories are subject to frequent premature failures.

(3) Airframe. The Airframe Log, enclosure (20), was inspected and appears to be in order. It is noted that this aircraft was used to perform the Accelerated Service Test Evaluation of the R7V-1 type aircraft (enclosure (26)). During this test the aircraft airframe acquired approximately 840 hours. The total time on the airframe was 1362.4 hours. This aircraft received a

progressive maintenance period at TEMCO. Since the progressive maintenance, the airframe had flown 504.4 hours. The history of the aircraft, enclosure (21), reveals that the aircraft was repaired at O&R, Norfolk, Va. because of a metal contaminated hydraulic system caused by failure of #3 engine driven hydraulic pump. Later a crack was found in the left wing rear spar web at wing station 285 where the after cooler actuator motor mount is attached to the web. Repair was made at the Lockheed Aircraft Corporation by installing an hour glass patch over the damaged area and installing an additional bolt attachment for the after cooler actuator motor structure. A study of the aircraft log shows that this aircraft experienced an almost uncontrollable pitch during a service test flight. This was due to a malfunction in the elevator control boost system. The Maintenance Discrepancy "carry over" log lists no discrepancies on the airframes when the aircraft was released for flight. The summary of discrepancies for the past two months, enclosure (17), reveals no unusual or repetitious discrepancies. Enclosure (23), Subj: Leaks in Integral Fuel Tanks, R7V-1 type aircraft, shows that an excessive number of wing tank gas leaks have occurred due to faulty application of sealant at the factory. R7V-1 BuNo 128441 had not been resealed in accordance with a current squadron project which was initiated as a result of enclosure (23). Metal fatigue was investigated. A check of squadron aircraft records revealed no cases of fatigue except as discussed in paragraph 20(b) of enclosure (26). It was noted by the Board that R7V-1 BuNo 128441 was one of the oldest squadron aircraft and was used for the Accelerated Service Trials and extensive flight training. During the course of these trials, maximum cruise power was used 66% of the time for a total of 502.0 hours. At this power setting, the aircraft was subjected to much vibration. Paragraph 20(b) of the report recommends reinforcement of some areas to reduce skin cracks. Hydraulic system malfunction was investigated. The squadron has been plagued by numerous hydraulic pump failures, leaks in the system, and system contamination. Paragraph 21 of the Accelerated Service Trial Report provides an excellent example of hydraulic malfunction. The Board considers that such a mishap could involve safety of flight if metal particles entered the booster control system. The aircraft could be controlled manually under normal conditions, but in turbulent weather, this situation would be undesirable. Explosive decompression was investigated. The design limits of the air tight hull exceed the output of the cabin compressors at 17,000 feet, even with all air leaks closed off. A rupture of the pressurized compartment would do no more than depressurize the cabin and require a descent to a lower altitude.

(4) Electrical and Electronic. A review of the Maintenance Release Sheet indicates that no electrical or electronic discrepancies existed at the time of release of the aircraft. However, the maintenance "carry over" log shows that a cannon plug for the co-pilots turn and bank indicator was in order and that the altitude control for the auto pilot would not function (requires fix designed by Lockheed). An altitude control is not essential to the auto pilot. Altitude can be maintained by using a manual knob. The cannon plug for the turn and bank was functioning properly, but was slightly loose. A review of the Summary of Discrepancies reveals a history of minor but routine radio malfunctions. A review of the Electronics Test Report ET 314-055 dated 21 June 1954 (classified - not included) conducted by the Naval Air Test Center shows that the receiving and transmitting equipment in the R7V-1 is unsatisfactory for world wide transport operations. This contention is further substantiated by the endorsement of the Commander, Fleet Logistic Air Wing, Atlantic/Continental contained in enclosure (26). Paragraph 28 of

the above enclosure relates some difficulties encountered with the FB-10 Auto Pilot. Some instances are on record where the amplifier has malfunctioned and placed a "full over" signal to the airlorens and caused the aircraft to bank at an angle of 40° (estimated) before the auto pilot was disconnected.

g. Weather. LT LEONARD was given an adequate weather briefing by (b) (6) AGC, Forecaster. LEONARD was given a weather vertical cross section and flight forecast marked enclosure (1) and enclosure (2). Nothing in the weather forecast precluded a flight at 17,000 feet. Moderate icing and moderate to heavy turbulence was forecast.

h. Crew Fatigue. Although the majority of the crew members had departed earlier at 1319 EST in R7V-1 BuNo 131637, which returned at 1839 EST (due engine trouble), the two crews aboard were joined into a double crew under the command of LT LEONARD by the Command Duty Officer in order to comply with Commander, Fleet Logistic Air Wing, Atlantic/Continental Instruction 3710.1, which allows a double crew 24 hours flight time. The second departure would have landed at Lajes well within the allowable crew time.

32. Analysis. In analyzing the probable cause of this accident, the Board has used the "elimination method" in reaching its conclusions. The following paragraphs will show the many avenues the investigation has followed:

a. Basic Assumption. It is assumed that the aircraft encountered a violent disruption to flight. This assumption is borne out by the fact no emergency transmissions were received from the aircraft after its last position report at 0430Z. Dispatches were sent to C.A., I.C.O., Air Force, and Navy communications agencies requesting such information. All replies were negative. Several radionen in this squadron were questioned to determine that the radionen were properly trained in emergency communication procedures. The results showed that they understood the procedures and, further, that their reaction to an emergency would be a prompt transmission of "mayday" and position report. The possibility of communication failure was explored but was discounted because the aircraft was equipped with three (3) transmitters, an ART-13, UHF, and VHF. A spare ART-13 was also carried. No radio discrepancies were reported or logged. The radionen in this squadron are trained to handle minor in-flight repairs to the radio equipment. It is noted in a dispatch from COMSABONE date time group 030350Z, that a "possible two or three unopened life rafts were sighted" by a search aircraft at 39-03N 68-28W. This position is not too distant from the last position reported by Navy 8441. If the above items had come from Navy 8441 it would indicate that the accident happened shortly after 0430Z. The background study of LT LEONARD shows that he was a previous seaplane pilot, and this experience would be valuable in effecting a safe ditching had the aircraft been under control at the time of impact. The crew aboard the aircraft were qualified in ditching and survival. The aircraft ditching bills were posted as required and the aircraft was well equipped with survival gear as listed in enclosure (25). Passengers were given a ditching lecture prior to flight. It seems probable that a successful ditching would have produced some survivors. This leads the Board to believe that the aircraft was not controllable at the time of impact.

b. Possible Causes that have been Discounted.

(1) Administrative. LT LEONARD failed to include the name of all crew members on the DD-175 form. They were correctly listed on the Weight and Balance form, enclosure (2). He failed to sign the aircraft release sheet. He did take a copy of this sheet and the aircraft log book. There were no discrepancies listed on the release sheet. Neither of the above would seem to contribute to the accident.

(2) Sabotage. A check of passenger orders and cargo bills of lading reveals no suspicious person or item. A thorough check of all squadron aircraft disclosed no questionable discrepancies.

(3) Crew. A record check reveals that all crew members were qualified for assigned billets. Enclosure (3) shows that LT LEONARD had demonstrated above average ability to handle emergencies. The Medical Officer's report discloses no physical or mental defects among crew members that would have disqualified them for flight.

(4) Fatigue. The two crews aboard were combined into a double crew. There was more than adequate relief for flight stations requiring continuous coverage. It was noted that upon arrival at LaJes, the crew would be well under the maximum crew time of 24 hours. At the time of the last position report, the majority of the crew members had been on alert or flying for approximately 11½ hours. It should be noted that one half of the crew performed no duties while aboard R7V-1 131637 on the original departure of Flight 124, and no duties during the 3½ hours ground time before the second departure in R7V-1 128441.

(5) Mid-air Collision. This possibility was considered by the Board, but was discounted because no other aircraft is known to be missing along the route of flight.

(6) Loss of Generators or Electronics Failure. Even with loss of all generators the turn and bank instruments will work on D.C. power from the emergency bus. With the aid of the airspeed, altimeter, and magnetic compass, instrument flight could be maintained. Despite loss of communications and radio compass, celestial navigation could have been used to proceed to LaJes or return to the U.S. There were two sextants and four chronometers aboard. All six pilots were qualified navigators. Battle lanterns and flash lights could be used for illumination. The instrument panel would be lighted by a white light from the emergency bus.

(7) Maintenance. Although some poor maintenance procedures were uncovered by the Board, none found could be directly related to the accident being investigated. The records indicate that the aircraft was in good condition prior to departure. Enclosure (31) is a statement by (b) (6) (b) (6) DC, concerning the release of R7V-1 BuNo 128441. It is noted by the Board that the squadron personnel allowance is being reduced. Many of the skilled technicians schooled by Lockheed are being transferred. It seems likely, if these reductions continue, that squadron operations will have to be reduced. Enclosure (26), final report of the Accelerated Service Trials conducted on R7V-1 BuNo 128441 demonstrates many of the maintenance problems on this and other squadron aircraft.

(8) Explosive Decompression. This possibility has been discounted in view of the evidence presented in paragraph 31 (investigation) of this Aircraft Accident Report.

(9) Structural Failure. Temporarily, this possibility has been discounted because of the evidence presented in paragraph 31 (investigation) under the heading of "Metal Fatigue". In the same paragraph it was noted that R7V-1 BuNo 128441 was subjected to more than average wear. Any weakening of the structure, combined with heavy turbulence, might be a possible cause of the accident.

c. Possible Causes that have Not been Discounted.

(1) Explosion due to Gas Leaks (Internal to the wing). ... history of gas leaks as shown in enclosure (23) has plagued the squadron for the past several months. At present, the Lockheed Aircraft Corporation has a team at Patuxent conducting a resealing program for the gas tanks in the R7V-1. Many of the leaks have been from the wing tanks into a void section of the wing. It is entirely conceivable that such a leak in the proper place could produce an explosive mixture. Under the right conditions there are several sources of ignition such as atmospheric discharges, shorted electrical wiring, engine fire, etc.

(2) Explosion due to Hydraulic or Lube Oil Vapor. Enclosure (24) is a photograph of an actual case where hydraulic oil in vapor form was introduced into the aircraft via the cabin pressurization system. The chalk lines in the photograph demonstrates how hydraulic oil, from a faulty seal in the hydraulic pump control valve, drained through the wing vent and crossed by boundary layer action to the intake of the cabin supercharger. The resulting mixture entered the cabin in sufficient quantities to reduce vision to the extent that the flight engineer was unable to see the rear of the aircraft. This item was passed to the Bureau of Aeronautics for further investigation. Enclosure (25) Airlant Aircraft Technical Letter No. 8 ATL-54 indicates that hydraulic fluid MIL-C-5606 in this form is dangerous. On several occasions cabin supercharger lube oil from faulty compressor seals has been introduced into the cabin. This does not appear to present an explosive problem if immediate steps are taken by the crew to effect smoke removal.

(3) Propeller or Nose Section Failure. There is one case on record where an R7V-1 has thrown a propeller due to either nose section failure or lost blade. This is a possible cause, if we consider the possibility of the blade striking a vital section of the aircraft plus the fire and structural hazard resulting and if the engine were not "shut down" promptly.

(4) Weather. LT LEONARD and crew were given a thorough weather briefing by Weather Central, Patuxent River, Maryland one hour prior to departure on their ill fated flight. The latest surface charts and charts of the 700 and 500 millibar level plus a prepared weather cross section were used in giving this briefing.

It is noted that the Flight Forecast Form (enclosure 22) and the vertical Cross Section (enclosure (1)), both given to the pilot, define the most significant weather as being at approximately 70° west and at 60° west. This weather, consisting of a cold front, with some scattered thunderstorms, and a

warm front with rain and moderate to occasionally heavy icing in clouds above the freezing level is somewhat typical of weather conditions over the North Atlantic for this time of year. LT LEONARD has been flying the North Atlantic routes for the past two years and it is thought that he was very familiar with this kind of weather. His choice of 17,000 feet altitude for this flight was a good one. According to the weather cross section 19,000 feet would have been an even better altitude. At any rate, he should have been on top, for the most part, except for the occasional buildups.

It must be pointed out that the R7V-1 is equipped with AFS-42 Airborne Radar and is always used when flying this sort of weather. The Electronic Shop at VR-1 labeled the radar set in R7V-1 BuNo 128441 as very good. The pilots were well indoctrinated in the correct use of this gear. In that all commercial airlines do not have airborne radar, pilots flying the R7V-1 are at a comparative advantage in flying the weather.

LT LEONARD was well schooled in thunderstorm penetration speed and technique. It is thought that if he did enter a thunderstorm he would have entered at the correct speed and would have flown the up and down drafts without fighting them.

As to icing, the R7V-1 is equipped to combat all forms of icing. Some deficiencies of the equipment are presented in paragraph 17(b) and (x) of enclosure (26). Anti-icing or de-icing facilities are provided for the leading edges of the wing and empennage, windshield, carburetors, propellers, radio antenna mast, and pitot heads. No previous discrepancies on this anti-icing and de-icing equipment on BuNo 128441 were noted, and it is surmised that all gear was working properly.

The weather that LT LEONARD was thought to have been subjected to was not beyond the capabilities of the R7V-1, nor was it thought to be beyond his own capabilities.

It is significant that the last position report received from LT LEONARD put him in the vicinity of 69° west when he transmitted a routine position and weather report. In that this was the approximate position of the significant weather, and nothing further was heard from Navy 8441, it is within the realm of possibility that the aircraft did encounter a sharp edge gust that was beyond the design limitations of the aircraft.

Enclosure (27) is a complete synopsis taken from the 0630Z 31 October 1954 surface map.

Enclosure (28) is a copy of the 0630Z 31 October 1954 surface chart.

33. Conclusions and Recommendations.

a. Conclusions.

(1) It is the opinion of the Board that R7V-1 BuNo 128441 did meet with a sudden and violent force, that rendered the aircraft no longer air-worthy, and was thereby beyond the scope of human endeavor to control. The force that rendered the aircraft uncontrollable is unknown.

(2) The Board concurs and strengthens the conclusions reached in the Accelerated Service Trials, enclosure (26) paragraph 32 as follows:

(a) The R7V-1 is unsatisfactory. It is not acceptable for the world-wide operations required by the Navy. No comparison can be made between VR-1 and commercial airline operations, because of the difference in the maintenance systems used. The lack of trained personnel and spare parts precludes adequate enroute maintenance. Instrumentation and electronics differs greatly between the R7V-1 and commercial versions of the super-constellation.

(b) The R-3350-34 engine is an unreliable engine for Navy transport type aircraft and requires excessive maintenance.

(c) The deficiencies noted in this report; namely gas leaks, electronics, hydraulics, and power plants, render the aircraft marginal from a safety standpoint during any operation.

b. Recommendations.

(1) That the aircraft be restricted to continental cargo flights until such time as a complete and formal test evaluation by the Naval Air Test Center of the R7V-1 has been conducted. All knowledge obtained by VR-1 during the operation of the R7V-1 should be made available in order to aid in the NATC evaluation.

(2) If the above recommendation is not considered feasible, it is recommended that the aircraft be restricted to continental cargo flight until a positive solution of the gas leak and electronic problems have been obtained.

(3) The Board further recommends that, as leads develop, it be left to continue to investigate this accident and submit reports of a positive nature as they occur.

MEDICAL OFFICERS REPORT OF AIRCRAFT ACCIDENTS/INCIDENTS AND GROUND ACCIDENTS
 OPNAV FORM 3750-8 (REV. 2-54)
 (Supersedes OPNAV Form 3750-7)

OPNAV REPORT 2700-1

GENERAL INSTRUCTIONS

- This report shall be filed in the event of an aircraft accident/incident which involves one or more of the following:
 Death Ditching
 Injury Water Crash
 Bail-out or Ejection (attempted or successful)
 Whenever physiological or psychological factors are involved
 Aircraft Ground Accidents resulting in serious injury
- Completion of the form shall be the responsibility of the flight surgeon
- For type accident and damage code refer to OPNAV INSTRUCTION 3750-6A.
- This form shall be prepared in quadruplicate. One copy shall be turned over to the Aircraft Accident Board for the Survival and Intelligence Officer in the case of combat incidents), and the original shall be air mailed (regular mail within 750 miles of Washington, D.C.) direct to Chief of Naval Operations (OP-37) Navy Department, Washington 25, D.C. within 4 working days following the accident. The third copy shall be mailed direct to Safety Equipment Branch, INAEER, Navy Department, Washington 25, D.C. The fourth copy shall be forwarded direct via air mail (regular mail within 750 miles of Norfolk, Va.) to the U.S. Naval Aviation Safety Activity, Naval Air Station, Norfolk 11, Virginia. Where more than one aircraft is involved, separate forms must be completed for each aircraft wherein one or more of the requirements in paragraph 1) above are applicable. (Additional copies may be prepared for use of squadron flight sergeants and other interested individuals)

1. FROM (State by station address) **NAS Patuxent River, Md.** 2. ACCIDENT OCCURRED (Geography favored) **North Atlantic** 3. TIME (Local) **10-30-54**
Air Transport Squadron ONE 2-54 **Unknown** 10-31-54

4. PLANE COVERED BY THIS REPORT MODEL **RW-1** BU. NO. **128441** NO. OCCUPANTS **42** UNIT OPERATING AIRCRAFT **Air Transport Squadron ONE** TYPE ACCIDENT **Y** **A**

7. OTHER PLANE (if involved) MODEL BU. NO. NO. OCCUPANTS UNIT OPERATING AIRCRAFT

8. NAME OF PILOT IN CONTROL OF AIRCRAFT AT TIME OF ACCIDENT/INCIDENT (Last, First, Middle) **LEONARD, John Gerard** (Plane Commander and assumed to be in control of aircraft.) UNIT PILOT ATTACHED TO **Air Transport Squadron ONE**

9. FLIGHT SURGEON'S CHECK LIST
 ALL PARTS OF FORM COMPLETED SURVIVORS NARRATIVES PHOTOS AS NEEDED RECOMMENDATIONS COPIES FURNISHED

10. SIGNATURE OF PILOT IN CONTROL OF AIRCRAFT (Last, First, Middle) **(b) (6)** RANK **LCDR** DATE **11-16-54**
 SIGNATURE OF COMMANDING OFFICER (Last, First, Middle) **(b) (6)** RANK **CAPT** DATE **11-16-54**

11. AIRCRAFT ACCIDENT AIRCRAFT INCIDENT COMBAT INCIDENT GROUND ACCIDENT

13. ACCIDENT DESCRIPTION

INCLUDE HERE A PARAGRAPH GIVING A BRIEF BUT FACTUAL ACCOUNT DESCRIBING THE ACCIDENT/INCIDENT. INCLUDE SUCH CAUSES AS BRUIN, ESTIMATES OF "G" FORCES, ANGLES OF IMPACT, SPEED ON IMPACT, ATTITUDE ON IMPACT, ETC. ATTACH PHOTOGRAPHS WHEN PERTINENT.

Aircraft RW-1, Bureau number 128441, departed US Naval Air Station, Patuxent River, Maryland at 0239Z on 31 October 1954 as FLOWING LANT/CONTINENTAL planned flight number 124 bound for Azores Islands. The flight was last heard from at 0430Z on 31 October 1954 when the position report was made indicating a position of 38.6N and 69.12W, cruising at 17,000 feet. No difficulties were reported at that time. After failure to hear from the aircraft again and attempts to contact the flight were unsuccessful, an intensive search was instituted which failed to locate either the aircraft or survivors.

14. PILOT FACTORS (Check pertinent pilot factors listed below)

	PILOT	CO-PILOT		PILOT	CO-PILOT
IN CONTROL AT TIME OF ACCIDENT/INCIDENT	X *		HYPOXIA SUSPECTED	Unknown	
AMOUNT OF FLIGHT TIME IN LAST 24 HOURS	0		CARBON MONOXIDE POISONING SUSPECTED	Unknown	
NUMBER OF FLIGHTS IN LAST 24 HOURS	0		FAULTY VISION	Unknown	
NUMBER HOURS DUTY IN LAST 24 HOURS	0		AEROBICISM	Unknown	
HOURS SINCE LAST FULL MEAL	4-5 hrs		BLACKOUT, GREYOUT, REDOUT	Unknown	
TIME AT CONTROLS THIS FLIGHT	Unknown		VERTIGO	Unknown	
TOTAL FLIGHT TIME	5107.3		NIGHT BLINDNESS	Unknown	
TOTAL FLIGHT TIME IN MODEL	711.5		FATIGUE	Unknown	
NUMBER PREVIOUS ACCIDENTS	None in record		DOMESTIC DIFFICULTIES	None known	
DATE OF LAST ACCIDENT	None in record		UNFAMILIARITY IN TYPE AIRCRAFT	No	
NUMBER DAYS GROUNDED IN LAST MONTH	0		ANXIETY REACTION	None known	
DATE LAST LOW PRESSURE INDOCTRINATION	8-6-53		LAST CER (date and score)	7-30-51	415 last record
AMOUNT SLEEP IN LAST 24 HOURS	8-9 hrs		OTHER PERTINENT FACTORS IN ACCIDENT (Describe below)		

15. COMMENTS ON ITEMS CHECKED UNDER ITEM 14 WHICH ARE PERTINENT TO ACCIDENT/INCIDENT. WHERE APPLICABLE, COMMENT BELOW ON ANY OF THE ABOVE FACTORS AFFECTING CREW MEMBERS OR PASSENGERS

From information obtained from relatives and close friends of the deceased it is assumed that all crew members were well within the normal limits both psychologically and physiologically.

* NOTE: As LT LEONARD was the assigned Plane Commander it is assumed that he was in control of the aircraft.

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16. INCLUDE SURVIVORS NARRATIVES

No survivors

(b) (6)
 (b) (6)
 (b) (6)

SUMMARY OF SAFETY EQUIPMENT, INJURIES AND CAUSE

DIRECTIONS

- 1. Use separate form for each person.
- 2. Under Injury Class, see following key:

Class "A" Fatal injury, is considered for reporting procedure as one that results in death prior to submission of the Aircraft Accident Report.
 Class "B" Critical injury is considered for reporting procedure as injury which threatens to result in death either from injuries sustained in the accident or from complications thereof. Critical injuries resulting in death within 30 days shall be reported as fatal to the original addressee.
 Class "C" Serious injury is considered for reporting procedure as injury which is critical but definitely requiring five or more days hospitalization and the individual will be expected receiving medical treatment but from which the individual will be expected to recover. Unsurpassed critical conditions or complications erroneously listed in this category which result in death within 30 days shall be reported by letter to the original addressee.
 Class "D" Minor injury is considered for reporting procedure as any injury less than serious.
 Class "E" No injury.
 Class "F" Unknown injury - lost and presumed drowned.
 Class "G" Unknown injury - missing.
 Class "H" Unknown injury - missing.
 Under disposition, see following key:
 "D" - Deceased
 "R" - Rescued
 "T" - Treated and returned to duty
 "H" - Hospitalized
 "P" - Pending prosecution
 "N" - Remains not recovered

1. NAME: LEONARD, John Gerard (b) (6)

2. GRADE/RATE: LT 32

3. AGE: 185

4. HEIGHT: 73"

5. POSITION OCCUPIED AT TIME OF ACCIDENT: Left Cockpit (assumed)

6. INJURY CLASS: L

7. DISPOSITION: Z

8. DUTY ASSIGNMENT: Plane Commander

SAFETY EQUIPMENT	MODEL/TYPE	AVAILABLE	USED	NOT USED	DAMAGED	LOST	WAS OXYGEN BEING USED AT TIME OF ACCIDENT	Unknown	YES	NO
SHOULDER HARNESS		X						Unknown		
LAP BELT		X						Unknown		
INERTIA REEL										
"G" SUIT										
HEADSET										
OXYGEN MASK / ZEP AERO - GOGGLES / Type mask		X						Unknown		
SHOES (type)										
FLIGHT SUIT, OTHER THAN "G" (type)										
EXPOSURE SUIT (type)										
OTHER (specify)										

11. COMMENT ON EFFECTIVENESS (check "No", "Yes", "As designed", etc., will not be accepted. If any equipment failed, describe failure and probable cause. See additional sheet, if necessary.)

12. IN CASE OF BURNS, FROSTING, OR FROSTBITE, LIST ALL CLOTHING WORN. USE ADDITIONAL SHEET, IF NECESSARY.

13. POST CRASH EXAMINATION

IF DEAD, LIST PRIMARY CAUSE (multiple answers are permitted)

INTERNAL INJURIES

IF HOSPITALIZED, GIVE DIAGNOSIS

ESTIMATED LENGTH OF HOSPITALIZATION

LIST PRE-EXISTING PHYSICAL DEFECTS PRESENT AT TIME OF POST CRASH EXAMINATION (as applicable parties)

ESTIMATED LENGTH OF SURVIVAL

14. INJURIES

UNCONSCIOUSNESS	DEGREE	1ST			2ND			3RD			LABORIZATION ENTIRE BODY
		HEAD (ventral)	(dorsal)	TRUNK (ventral)	(dorsal)	EXTREMITIES (upper)	(lower)				

UNCONSCIOUSNESS: SHORT DURATION-LITTLE SIGNIFICANCE OTHER (fill in)

HEAD: CEREBRAL CONCUSSION MINOR SERIOUS CRITICAL FATAL

MINOR FACIAL INJURIES: MINOR SERIOUS CRITICAL FATAL

MAJOR FACIAL INJURIES: MINOR SERIOUS CRITICAL FATAL

INJURIES: MINOR EYE INJURIES RIGHT EYE LEFT EYE

MAJOR EYE INJURIES: RIGHT EYE LEFT EYE

TYPE	SKULL	VERTEBRAE (specify no.)					SHOULDER GIRDLE	RIBS	PELVIS	UPPER ARM/CHER ARM		HAND		UPPER LEG/LOWER LEG		FOOT	
		CERV	THOR	LUMBAR	SACRAL	COCCYX				LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
SIMPLE FRACTURE																	
COMPOUND FRACTURE																	
COMMINUTED FRACTURE																	
DISLOC.																	
CAUTION																	

AMPUTATIONS - STATE PARTS

AREA OF INVOLVEMENT		LACERATIONS			CONTUSION/SPRAIN/STRAIN			ABRASIONS			SHOCK	EXPOSURE
		MILD	MODERATE	SEVERE	MILD	MODERATE	SEVERE	MILD	MODERATE	SEVERE		
HEAD	VENTRAL											
	DORSAL											
NECK	VENTRAL											
	DORSAL											
THORAX	VENTRAL											
	DORSAL											
ABDOMEN	VENTRAL											
	DORSAL											
EXTREMITIES (upper)												
EXTREMITIES (lower)												

15. IN CASE OF INJURIES (give address as in case of each injury indicated above. Give specific parts of aircraft involved. Entries of "No", "None", "Not stated" or "Injury", or "Indeterminate" with an explanation will not be accepted. See additional sheet, if necessary.)

IDENTIFIED TO BE A TRUE COPY (b) (6)

UNIT **VR-1**
 DATE ACCIDENT **10-30-31/54**
 MODEL **R7V - 1**
 BU NO **128/11**

DITCHING AND WATER CRASH REPORT

1. CONTROLLED DITCHING **Unknown** 2. WATER CRASH **Unknown**

3. WEATHER SEA SLIGHT MODERATE ROUGH **Unknown** WIND VELOCITY (Knots) (Sea temp. °F) (Surface temp. °F) **Unknown Unknown Unknown**

4. PROCEDURES
 CANOPY JETTISONED OPEN CLOSED
 POWER ON OFF **Unknown**
 WHEELS UP DOWN
 FLAPS UP PARTIAL FULL
 DITCHED INTO WIND DOWN WIND CROSS WIND **Unknown**

5. IMPACT (Estimated)
 ALTITUDE **Unknown** WIND **Unknown** SPEED (Knots indicated) **Unknown** STOPPING DISTANCE (ft.) **Unknown** NO. OF IMPACTS **Unknown** TIME A/C FLOATED (Sec) **Unknown**

6. EXIT **Unknown**

	NAME	SILLET	UNDERWATER	PLACE OF EXIT	DIFFICULTIES
A		PILOT			Denote below under A, B, C, and D.
B					
C					
D					

A					
B					
C					
D					

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7. SURVIVAL EQUIPMENT

	SHOES		GLOVES		LIFE VEST		EXPOSURE SUIT		RAFT		USED TO ATTRACT ATTENTION					
	TYPE	DAMAGED	TYPE	DAMAGED	TYPE	DAMAGED	TYPE	DAMAGED	TYPE	DAMAGED	DYE	FLARES	FLASHLIGHT	MIRROR	SUN	RADIO
A																
B																
C																
D																

8. LIST CAUSE OF DAMAGE, IF ANY, TO SURVIVAL EQUIPMENT (include photo of damage) (see additional sheet, if necessary)
 9. LIST ANY DIFFICULTIES OR FAILURES IN USE OF SURVIVAL GEAR (see additional sheet, if necessary)
 10. TIME IN RAFT _____ TIME IN WATER _____ METHOD OF RESCUE _____
 11. LIST EQUIPMENT DROPPED TO SURVIVORS, STATE IF USED EFFECTIVELY (see additional sheet, if necessary)
 12. LIST ALL ITEMS IN SURVIVAL KIT WHICH WERE USED - EFFECTIVENESS (List those unused items which failed or were lost - Recommendations) (see additional sheet, if necessary)
Unknown
 13. INCLUDE SURVIVORS NARRATIVES **No survivors**

CERTIFIED TO BE A TRUE COPY
 (b) (6)

Supplemental addendum to OPNAV Form 100-10, U.S. Number 2-54, Air Transport Squadron ONE, NAS Patuxent River, Md.

Name and duty	Rate/rank	Number	Age	Weight	Height	Injury Class	Disposition
POSTIKA, Peter Joseph First Pilot, Crew	LT USNR	(b) (6)	31	192	68"	L	Z
SPRINGS Jr., Rodney Searle Second Pilot, Crew	LT USNR	(b) (6)	33	175	59½"	L	Z
ROBERTS, David S. Observer, Crew	LT USNR	(b) (6)	?	?	?	L	Z
DEMOULD, Gerald Earl Flight Mechanic, Crew	AME2 NR	(b) (6)	22	182	70½"	L	Z
NEIDLE, Frank Thomas Flight Engineer, Crew	ALC USN	(b) (6)	32	146	69"	L	Z
THOMAS, Robert Truman Flight Engineer, Crew	AD1 USN	(b) (6)	32	168	68"	L	Z
MEYERS, Raymond Rudolph Radioman, Crew	AL3 USN	(b) (6)	24	159	67½"	L	Z
GRAZIANO, Frank John Orderly, Crew	AM USN	(b) (6)	24	149	65"	L	Z
BESTIKOWITZ, Florence (n) Orderly, Crew	SN USN	(b) (6)	21	109	62½"	L	Z
MOORE, Noel Robert Carpenter, Crew	HM3 USN	(b) (6)	22	174	71"	L	Z
ELLEN, Herbert William Plane Commander, Relief Crew	LT USNR	(b) (6)	32	167	68½"	L	Z
KLEMENTI, Russell Lawrence First Pilot, Relief Crew	LT USNR	(b) (6)	33	158	66½"	L	Z

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REFERRED TO MIA & IAWC UNIT
 (b) (6)

Name and duty	Rate/Grade	Number	Age	Weight	Height	Injury Class	Disposition
COLE, John Sanford First Pilot, Relief Crew	LCDR USN	(b) (6)	34	166	69½"	L	Z
ROBERTS, Johnnie Hart Flight Mechanic, Relief Crew	AEC2 USN	(b) (6)	23	140	68"	L	Z
STIEMENSCH, Robert Theodore Flight Engineer, Relief Crew	ALC USN	(b) (6)	32	155	68½"	L	Z
HUNTLEY, Eugene (n) Flight Engineer, Relief Crew	ALC USN	(b) (6)	29	146	69"	L	Z
PFLAGER, James Richard Radioman, Relief Crew	LT2 USN	(b) (6)	24	130	69"	L	Z
SMALLY, Lewis Ballard Orderly, Relief Crew	AN USN	(b) (6)	23	155	65½"	L	Z
WOLEY, Marianna Lucille Orderly, Relief Crew	SN USN	(b) (6)	22	123	67"	L	Z
DAVIS, John Timothy Corpsman, Relief Crew	HE13 USN	(b) (6)	23	138	66"	L	Z
HARR, Geraldine Ida Passenger	DPD USN	(b) (6)	?	?	?	L	Z
HARR, David Roger Passenger	DPD USN	(b) (6)	11	?	?	L	Z
HARR, Timothy Jay Passenger	DPD USN	(b) (6)	6	?	?	L	Z
HARR, Kathy Ann Passenger	DPD USN	(b) (6)	3	?	?	L	Z

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CERTIFIED TO BE A TRUE COPY
(b) (6)

Name and duty	Rate/Rank	Number	Age	Weight	Height	Injury	Class	Disposition
JACOBSEN, Gilbert (n) Passenger	LT USNR		?	?	?	L		Z
JACOBSEN, Ida Ann Passenger	LPD USN		?	?	?	L		Z
JACOBSEN, Craig Arthur Passenger	DPD USN		2	?	?	L		Z
JACOBSEN, Ceryl Leigh Passenger	DPD USN		2	?	?	L		Z
COLLINS Jr., Cornelius P. Passenger	EMS USN		?	?	?	L		Z
WAYNE, Billy Joe Passenger	SA USN		?	?	?	L		Z
WARREN, Ronald LeRue Passenger	SA USN		?	?	?	L		Z
WHITE, James (n) Passenger	SA USN		?	?	?	L		Z
WILLINGHAM, George Owen Passenger	SA USN		?	?	?	L		Z
HINDMAN, Leonard Roy Passenger	SN USN		?	?	?	L		Z
GREGG, John Edward Passenger	RM1 USN		?	?	?	L		Z
MUSCARELLI, Valentine (n) Passenger	DT3 USN		?	?	?	L		Z

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RESTRICTED TO MR. A. JACKSON

(b) (6)

Name and duty	Rating	Number	Age	Weight	Height	Injury Class	Disposition
BAXER, Francis Earl Passenger	LTC USN		?	?	?	L	Z
FOGQGIS Jr., George W. Passenger	CIV		?	?	?	L	Z
RIDLE, Robert L. Passenger	LTC USN		?	?	?	L	Z
HERGOLD, Joseph W. Passenger	MAJ USAF		?	?	?	L	Z
ADRILL, Edward H. Passenger	MAJ USAF		?	?	?	L	Z

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(b) (6)

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VERTICAL CROSS SECTION

FROM PAK TO LAKES TRACK 20. + 4. 31/013. 2 E.T.D. 31/013. 2
the line
46. 3100 A GP



FORM 1-10-53

N.A.S. PATUXENT RIVER, MARYLAND

X - 5 No. 10
 || - Rain

Rain

Y LIGHT ICING
 M mod
 H HEAVY ICING
 Turb
 mod Turb
 Hvy Turb

FORECASTER

J. Miller

D A K S ° A F E T Y Δ F I L M □

CLEONARD EDEN RAD MEICAL PILAGER
 P. MUST. KA - KIMMELI ORD. CARL AND - SANCY
 NAV SPALIC - [REDACTED] EXTRA [REDACTED]
 EMEIDL - THOMAS F.M. DYER - ROBERTS
 [REDACTED] - ROBERTS - COLE [REDACTED] - [REDACTED]

FLIGHT 124 BUNO 12444 DATE 10-30-54
 FROM PAX TO LAJES

A.C.L. COMPUTATION

ALLOWABLE GROSS WT. LESS GAS	105,000
BASIC WT.	71,541
OIL GALS.	1,500
CREW	21
EVANS GEAR	Nil
SEATS	27
LITTERS	4
MISC.	Nil
OPER. WT. LESS GAS	(-) 7,902.5
COMPUTED A.C.L.	25,975
FUEL OVER	2,000 (-) 7,844
ADJUSTED A.C.L.	18,131
LESS THRU LOAD	(-) Nil
LOAD ALLOWABLE THIS STA.	18,131

LOAD COMPUTATION		
LOAD	THRU NO. WEIGHT	LOCAL NO. WEIGHT
PASS.	Nil	21 3360
BAGS	Nil	1065 1065
CARGO	Nil	6075 6075
MAIL	Nil	2745 2745
TOTAL	Nil	13265 13265
OPER. WT. LESS GAS		7,902.5
ZERO FUEL CONDITION		92,290

	INDEX WEIGHT	ST. INDEX
BASIC WT.	71,541	72.8
OIL	1,500	89.0

TA NO.	CREW	MISC.	NO.	SEATS	NO.	PASS.	BAGS	CARGO	MAIL	
A										A
B	4	400								B 81.6
C										C
D	1	200								D 80.1
E	2	400	64	2	66					E 77.1
F	4	800		4	132					F 73.1
G	4	800		4	132			1372	2304	G 66.5
H	4	800		4	132			2442	3374	H 62.2
I				4	132			2341	2413	I 62.8
J				4	132	1	160		272	J 63.2
K				10	132	1	960		1290	K 67.1
L				10	132	6	960		1290	L 73.0
M	2	400		10	132	4	1240		2010	M 85.2
N										N
O										O
P										P
Q										Q
R								1065	1065	R 81.8
S									1789	S 87.7
T									756	T 92.0
U	21	4200	64	62	1716	21	3360	1065	2745	U 92.290

STATION	WEIGHT	INDEX	DESCRIPTION	WEIGHT	INDEX
			ZERO FUEL CONDITION	20.8	SMAC 92290 72.6
			FWD. CENTER WING		GALS.
			AFT. CENTER WING		GALS.
			OUTER WING		GALS.
			RSD FUSELAGE FUEL		GALS.
			WING FUEL	6120	GALS. 75444 95.2
			GROSS TAKE-OFF COND.	241.3	SMAC 128134 95.2

COMPUTED BY: (b) (6)
 APPROVED BY: [REDACTED]
 ACCEPTED BY: [REDACTED]

SMAC CORRECTED

ZERO FUEL COND.
 TOTAL FUEL
 TAKE-OFF COND

(b) (6)

ENCLOSURE (2)

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PJA/rjk
2 November 1954

AAR Board document in the aircraft accident involving R7V-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on on about 31 October 1954.

The following is a statement by LCDR (b) (6) Chief Flight Inspector, Air Transport Squadron One, concerning the proficiency of LT LEONARD and LT EDEN as R7V Plane Commanders.

LT LEONARD

1. LT LEONARD was personally checked by me on Flight 124/23 on the night of 23 October 1954, flying R7V-1 BuNo 131635, as pilot in the left seat, from Patuxent River, Maryland to Lajes Field, Azores.
2. He demonstrated a high degree of proficiency throughout, and impressed me as being an R7V Plane Commander possessing above average aeronautical ability.
3. LT LEONARD, during the course of above mentioned flight, was questioned at great length concerning his overall knowledge of the R7V-1. Simulated emergencies were given pertaining to cabin fires, belly fires, electrical fires, smoke removal, hydraulic system failure, runaway props, and many others. LT LEONARD had a ready and correct answer to each problem. It might be added that the above is asked of all plane commanders being checked, in addition to observing them in the performance of their duties and their flight technique.
4. In conclusion, I have flown with LT LEONARD on several occasions during the past two years and he has always demonstrated his above average ability as a pilot and as a naval officer. He has been utilized as an R7V-1 Instructor and is very cool headed. I have always felt that if a problem were encountered in flight, and it was humanly possible to cope with, LT LEONARD could do so.

LT EDEN

1. I have personally flown with LT EDEN on many occasions during the past two years. I have observed him to be a plane commander possessing above average aeronautical ability.
2. During training flights as well as line flights, LT EDEN was observed to know the R7V-1 well and demonstrated his ability to cope with all emergencies in a thorough manner.
3. Flight Inspection Reports from other inspectors indicate that LT EDEN always conducted a safe flight, always adhering to all rules and regulations and flying the R7V-1 in a standardized manner.

Enclosure (3)

FHA/rjk
2 November 1954

4. In conclusion, LT EDEN, has always been considered by me as one of Air Transport Squadron One's outstanding plane commanders. As one of the few R7V plane commanders to be utilized as a Flight Instructor, his high standards and vast aeronautical knowledge was passed on to the other squadron pilots.

(b) (6)

Certified to be a true copy.

(b) (6)

(b) (6)

LCDR, USN

Enclosure (3)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

FGC/rjk

AAR Board document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

LT JOHN G. LEONARD

LT John G. LEONARD was born (b) (6)

He was designated a Naval Aviator October 24, 1944.

From November 1944 to January 1945, LT LEONARD attended the Instrument Flight Instructor School NH-1, at NAS Atlanta, Ga. From January 1945 to January 1946 he was a basic and instrument instructor in squadron VN 300 SNJ aircraft at NAS Whiting Field, Florida. From September 1946 to June 1947 he attended a five term program at Villanova College.

From July 1947 to December 1947 he attended refresher training course at ATU-10 NAS Jacksonville, Fla. in F4M type aircraft. From March 1948 to June 1950 he was a Patrol Plane Commander, with the administrative duties as material officer. From August 1950 to August 1952 he was an instructor in F4M type aircraft at NAS Corpus Christi, Texas.

LT John G. LEONARD reported to Transport Squadron One in September 1952 and served as a Plane Commander in R5D and R7V aircraft with administrative duties as Assistant Ground Training Officer. He completed the Acceptance Transfer and Training Unit Transport School at Corpus Christi, Texas on 25 June 1953. He had a total flight time of 5107.3 hours and a total flight time of 711.5 hours in the R7V aircraft. In the last twelve months he had flown 602.2 hours total, 133.2 hours instrument, and 133.2 hours night. In the last three months he had he had flown 200.5 hours total, 23.1 hours instrument, 19.9 hours night. He had a valid instrument rating in the R7V dated May 26, 1954. He was given a line proficiency check in October 1954. He was graded above average on all these checks. His pilot training jacket was reviewed. LT John G. Leonard was considered an above average pilot for this type duty.

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Enclosure (4)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
P. TUXENT RIVER, MARYLAND

FGC/rjk

AIR Board document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

LT (b) (6) EDEN

LT EDEN was born (b) (6). He was designated a (LT.) pilot in March 1944, and (LT.) in October 1946. From April 1943 to July 1943 he attended the Pro-Flight School at Ottumwa, Iowa. From August 1943 to November 1943 he attended (LT.) training at the Naval Air Station, Moffett Field, California. From December 1943 to February 1944 he attended (LT.) training at Naval Air Station, Lakehurst, New Jersey. From December 1944 to July 1945 he served as a (LT.) pilot in the Atlantic and Pacific areas. From August 1945 to April 1947 he went through (LT.) training at the Naval Air Station, Dallas, Corpus Christi, Texas, and Pensacola, Florida. From May 1947 to December 1947 he served in Transport Squadron Eleven in the Pacific. LT H.W. EDEN reported to Transport Squadron One in June 1952. He held the designation of Plane Commander in the R5D and R7V aircraft. He completed the Acceptance Transfer and Training Unit Transport School at Corpus Christi, Texas on 20 November 1952. He had a total flight time of 4505.5 hours and a total flight time of 671.6 hours in the R7V aircraft. In the last 12 months he had flown 719.0 hours total, 141.4 hours instrument, and 160.7 hours night. In the last 3 months he had flown 204.0 hours, 56.5 hours instrument, and 25.3 hours night. He had a valid instrument rating dated June 20, 1954. LT H.W. EDEN was graded above average on this check. His training jacket has been reviewed and he was considered to be above average in all phases, and above average as a transport pilot.

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Enclosure (5)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

FGG/rjk

...R Board document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

LT PETER J. MESTIK,

LT Peter J. MESTIK was (b) (6). He was designated a Naval Aviator November 1, 1944. From January 1, 1945 to May 5, 1945 he was in Operational Training at Naval Air Station, Jacksonville, Florida. From May 5, 1945 to November 1945 he was attached to VFH-4 as a pilot with the administrative duties as Photographic Officer. From January 1946 to May 1946 he was attached to the First Naval District with the Administrative Duties as Ships Service Officer. From May 1946 to April 1947 he served at the Naval Air Facility, South Weymouth, Massachusetts, as a Utility Pilot. From October 1949 to October 1952 he was attached to the Naval Reserve Squadron 911 as a pilot. He reported to Transport Squadron One December 1, 1952. LT P.J. MESTIK held the designation in Transport Squadron One as a Transport Navigator and First Pilot in the R7V aircraft. He had a total flight time of 3031.4 and a total time in the R7V aircraft of 604.0 hours. In the past 12 months he had flown a total of 651.4 hours, 116.9 instrument hours, 144.6 night hours. In the last 3 months he had flown 144.4 hours total, 36.9 instrument hours, 46.2 night hours. He had a valid special instrument rating in the R7V aircraft dated September 8, 1954. The training jacket of LT P.J. MESTIK has been reviewed and his grades were average to above, there were no deficiencies noted, and he was considered to be an average first pilot.

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Enclosure (6)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
P. TUXENT RIVER, MARYLAND

FOC/rjk

Joint Board document in the aircraft accident involving R7V-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

LT RUSSELL L. KLEMETTI

LT KLEMETTI was born (b) (6). He was commissioned Ensign and designated Naval Aviator February 15, 1944. From June 1944 to October 1945 he was attached to VFD-27 as a pilot, with administrative duties as Assistant Navigation Officer. During his tour with VFD-27 he attended the GCN School in Panama River, Florida, and the Instrument Flight School at Atlanta, Georgia. From November 1946 to April 1947 he was attached to GCN Unit Four, as a GCN approach controller. LT R.L. KLEMETTI was on inactive duty for a period of time but from May 1951 to July 1952 he was attached to an Organized Reserve Squadron flying R4B - JRB type aircraft. He reported to Transport Squadron One September 20, 1952 where he had performed duties as line pilot. LT KLEMETTI held the designation as a Transport Navigator and R5D, R7V first pilot. He completed the Acceptance Transfer and Training Unit Transport School at Corpus Christi, Texas December 18, 1953. LT R.L. KLEMETTI had a total of 3403.2 hours and a total time of 643.0 hours in the R7V aircraft. In the last 12 months he had flown 644.4 hours, 90.7 hours instruments, 150.3 hours night. In the last 3 months he had flown 210.3 hours, 30.9 hours instruments, 59.3 hours night. He holds a valid special instrument rating dated August 10, 1954 and was route checking for a Plane Commander designation in Transport Squadron One. His training jacket has been reviewed and all his marks were average to above. LT R.L. KLEMETTI was an above average co-pilot.

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Enclosure (7)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
POTOMENT RIVER, MARYLAND

FGC/rjk

WAR Board document in the aircraft accident involving RTV-1 Bureau Number 120441 piloted by LT John G. LEGARD, (b) (6) USN, which occurred on or about 31 October 1954.

FRANK THOMAS MEIDL, LDC, USN

MEIDL was born (b) (6) he was attached to the Operations Department, Norfolk, Virginia as a plane captain. From 1942 to 1944 he was a plane captain in VR-7. From 1944 to 1946 he was attached to VT-93 as the leading chief. From 1946 to 1948 he was attached to FLSRON 101 in the Maintenance Department. From 1948 to 1950 he was attached to VX-4 as a plane captain, and held the designation as flight engineer. F.T. MEIDL, LDC completed the Flight Engineers Ground Training Course at the Lockheed Aircraft Corporation School, Burbank, California. Chief MEIDL had over 4000 hours flight time as a flight mechanic. Chief MEIDL was designated as first flight engineer 16 April 1953, and was considered qualified in all respects. He was considered above average in all his grades and write ups given by pilots in this squadron.

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Enclosure (6)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
P. TUXENT RIVER, MARYLAND
FGC/rjk

AAR report document in the aircraft accident involving R7V-1 Bureau Number
120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on
or about 31 October 1954.

EUGENE (n) HUNTLEY, ADC, USN

HUNTLEY was born (b) (6). He reported to Transport Squadron One in
May 1950. He was rated as ADC before reporting to the squadron. During his
tour of duty, he had been employed in the Maintenance Department as an aviation
mechanic, and on scheduled flights as a flight engineer. Chief HUNTLEY had
completed the Flight Engineers Ground Training Course at Lockheed Aircraft
Corporation School, Burbank, California. Chief HUNTLEY had a total of more
than 4000 hours flight time as flight mechanic and he held a first flight
engineers designation dated October 1953. He was considered above average
as a flight engineer by the pilots in Air Transport Squadron One.

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Enclosure (9)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND FGC/rjk

WAR Deard document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD (b) (6) USN, which occurred on or about 31 October 1954.

LT RODNEY S. SPRIGG

LT SPRIGG was born (b) (6). He was designated a naval aviator on 1 January 1944. From January 1944 to April 1944 he attended advanced WF training in Florida. From April 1944 to June 1945 he was attached to a CVE as a pilot. From June 1945 to November 1945 he was at various air stations as a pilot. From November 1945 to January 1946 he was attached to a west coast air station as a test line pilot. From January 1946 to July 1950 he was stationed at Naval Air Station, Los Alamitos, California, in the Organized Reserve. From July 1950 to January 1952 he was attached to CV-31 in WF-31 as a pilot, with the administrative duty as Material Officer. From January 1952 to January 1954 he was at the Naval Air Station, Corpus Christi, Texas, as a pilot with administrative duties as a Legal Officer. LT SPRIGG reported to Transport Squadron One in January 1954 and served as a line pilot in the R7V aircraft, with administrative duties as Assistant Legal Officer. He completed the Acceptance Transfer and Training Unit Transport School at Corpus Christi, Texas on 26 March 1954. LT R.S. SPRIGG had a total flight time of 2959.2 hours and hold the designation of Transport Navigator and R7V second pilot. In the last 12 months he had flown 520.7 hours, 430.3 were in the R7V aircraft, 50.6 hours instrument, 31.4 hours night. In the last 3 months he had flown 192.1 hours, 100.8 in the R7V, 15.0 hours instrument, 10.3 hours night. He had a valid standard instrument rating dated August 18, 1954. His training jacket had been reviewed and all grades were average to above. LT R.S. SPRIGG was considered an average co-pilot.

02

Enclosure (10)

NAVY TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
POTOMAC RIVER, MARYLAND FGC/rjk

WAR Board document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

LT RODNEY S. SRIGG

LT SRIGG was born (b) (6). He was designated a naval aviator on 1 January 1944. From January 1944 to April 1944 he attended advanced VF training in Florida. From April 1944 to June 1945 he was attached to a CVE as a pilot. From June 1945 to November 1945 he was at various air stations as a pilot. From November 1945 to January 1946 he was attached to a west coast air station as a test line pilot. From January 1946 to July 1950 he was stationed at Naval Air Station, Los Alamitos, California, in the Organized Reserve. From July 1950 to January 1952 he was attached to CV-31 in WF-31 as a pilot, with the administrative duty as Material Officer. From January 1952 to January 1954 he was at the Naval Air Station, Corpus Christi, Texas, as a pilot with administrative duties as a Legal Officer. LT SRIGG reported to Transport Squadron One in January 1954 and served as a line pilot in the R7V aircraft, with administrative duties as Assistant Legal Officer. He completed the Acceptance Transfer and Training Unit Transport School at Corpus Christi, Texas on 26 March 1954. LT R.S. SRIGG had a total flight time of 2959.2 hours and hold the designation of Transport Navigator and R7V second pilot. In the last 12 months he had flown 520.7 hours, 430.3 were in the R7V aircraft, 50.6 hours instrument, 31.4 hours night. In the last 3 months he had flown 192.1 hours, 100.0 in the R7V, 15.0 hours instrument, 12.3 hours night. He had a valid standard instrument rating dated August 18, 1954. His training jacket had been reviewed and all grades were over to above. LT R.S. SRIGG was considered an average co-pilot.

02

Enclosure (10)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

FGC/rjk

Accident Board document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

LCDR JOHN S. COLE

LCDR John S. COLE was born (b) (6)

He was designated a Naval Aviator in June 1943. From July 1943 to September 1945 he served aboard the USS FRANKLIN in VI-13, as a bombing pilot with administrative duties as Engineering Officer. From February 1945 to October 1945 he served aboard the USS LAKE CHARLENE in VI-150 as a bombing pilot with the administrative duties as Engineering Officer. From June 1946 to January 1948 he was assigned to duty at Bureau of Aeronautics as a project officer. From February 1948 to December 1948 he attended General Line School as a student. From January 1949 to November 1951 he was Officer in Charge of HU-2 detachment aboard numerous carriers and cruisers in the Pacific. From November 1951 to November 1953 he was assigned to Service Test Center as a Project Pilot at the Naval Air Test Center, Naval Air Station, Patuxent River, Maryland. LCDR John S. COLE reported to Air Transport Squadron One in November 1953 where he performed the duties as navigator, co-pilot, with administrative duties as project officer and flight engineering officer. He completed the Acceptance Transfer and Training Unit Transport School at Corpus Christi, Texas on 26 February 1954. LCDR John S. COLE had a total flight time of 2964.5 hours. In the past twelve months in the R7V he had flown 502.7 hours total, 62.4 hours instrument, and 86.5 hours at night. In the last three months, he had flown 147.0 hours total, 32.5 hours instrument, and 29.6 hours night. LCDR John S. COLE held the designation of first pilot and first navigator in the R7V aircraft. He held a valid standard instrument rating in the R7V. He was given his last proficiency check in September 1954. His grades on all checks were average to above average.

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Enclosure (11)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
P. TUXENT RIVER, MARYLAND

FGC/rjk

AIR Board document in the aircraft accident involving RTV-1 Bureau Number 120441 piloted by LT John G. IECARD, (b) (6) IEN, which occurred on or about 31 October 1954.

ROBERT TRUBMAN THOMAS, AD1, IEN

THOMAS was born (b) (6). He reported to Air Transport Squadron One on 1 December 1949. He was rated as AD1 before reporting to the Squadron. During his tour of duty he was employed in the Maintenance Department as a member of an engine check crew, and trouble shooter. Robert THOMAS was designated a second flight engineer 30 August 1954 in the RTV type aircraft. He had a total of 40.0 hours panel time, and 19.5 hours observation time during the Flight Engineers Transition training period. A review of the training jacket of Robert THOMAS indicated that he was an average second flight engineer, and would be considered for first flight engineer after he had more experience on the engineers panel. ROBERTS was considered average by the pilots of Air Transport Squadron One.

04

Enclosure (12)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
P. TUXENT RIVER, MARYLAND

FGC/rjk

WAR Board document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

ROBERT T. STEPHENSON, LDC, USN

STEPHENSON was born (b) (6). He reported to Air Transport Squadron One on 20 April 1954. He was rated as LDC before reporting to the squadron. During his tour of duty he was employed in the Maintenance Department as an aviation mechanic and on scheduled flights as a flight mechanic. Chief STEPHENSON was designated 25 October 1954 as a second flight engineer in R7V type aircraft. He had a total of 57.3 hours panel time, and 21.5 hours observation time. A review of his training jacket indicated that he was average to above, and had been recommended for route checks to qualify as a first flight engineer. Chief STEPHENSON was considered above average by the pilots of Air Transport Squadron One.

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Enclosure (13)

AAR Board document in the aircraft accident involving R7V-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

DITCHING AND SURVIVAL QUALIFICATIONS.

The records show that all personnel aboard R7V BuNo 128441 which was lost at sea October 31, 1954 were up to date on their ditching qualification, in accordance with VR-1 Instruction 3730.3 dated 29 October 1953 - Subj: R7V Ditching Bill.

(b) (6) AMC
Survival Instructor

(b) (6) LT
Survival Officer

Certified to be a true copy.

(b) (6)

(b) (6)

LCDR, USN

Enclosure (14)

JCC/rjk
10 November

AAR Board document in the aircraft accident involving R77-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

FLEET LOGISTIC AIR WING
CARGO MANIFEST

Squadron	Station	Sq. Aircraft No.	Flight No.	Date	Loading Crew (Petty Officer(s))
VR-1	PAXRIV	128441	124/30	10-30-54	
Signed					(Signature)
(b) (6)					

Pri- ority	Blading No.	Description	Final No.		Compt Loaded
			T.P.	Des. PCS Weight	
2-91	1784426	SPACER ASSY	PTY	1 33	H
2-91	15475302	RANGE	do	1 68	H
2-91	795-55	PHOTO EQUIPMENT	do	6 242	I
2-91	17860780	ELECT. INSTRUMENTS	do	6 155	H-I
2-91	30431297	MISC	do	6 242	H-I
2-91	32000637	MISC	do	6 313	I
2-91	6267732-A	ELECT. INSTRUMENTS	do	1 68	G
2-91	32000549	MISC	do	10 746	H-I
2-91	31784457	GASKETS	do	1 12	I
2-91	15410934	CYLINDER ASSY	do	4 296	H-I
2-91	17860913	MISC	do	4 164	I
2-91	32000813	DRIVE UNIT	do	3 155	H-I
2-91	30430606	MACHINERY PARTS	do	6 357	H-I
2-91	30430637	MISC	do	6 606	H-I
3-91	30429670	CHAIN	do	1 742	G
3-91	30431054	MACHINERY PARTS	do	2 68	H
3-91	30431064	GENERATOR	do	1 59	H
3-91	30431254	MACHINERY PARTS	do	1 70	G
3-91	6267772-A	TOWING BARS	do	2 330	H-I
	MAIL	TOTAL PCS THIS PAGE 70		C.FGO	
	S - 1909	TOTAL WGT THIS PAGE 5310		0 - 1372	
		TOTAL PCS THIS FLIGHT 76		6 - 2442	
		TOTAL WGT THIS FLIGHT 6895		1 - 2261	

Certified to be a true copy.

(b) (6)

(b) (6)

ICDR, USN

Enclosure (15)

JCC/rjk
10 November 1954

AAR Board document in the aircraft accident involving R7V-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

FLEET LOGISTIC AIR WING
CARGO MANIFEST

Squadron	Station	Sq. Aircraft No.	Flight No.	Date	Loading Crew (Petty Officer(s))		
VR-1	FAIRIV		124/30	10-30-54			
Signed (b) (6)					(Signature)		
Pri- ority	Blading No.	Description	T.P.	Final Des.	No. PCS	Total Weight	Comp't Loaded
2-91	30429588	SHIFTS		N.FLES	1	162	G
2-91	31784456	V.LIVES		do	1	210	G-H
2-91	30430404	MISC		do	3	274	H
2-91	32000806	METER		do	1	35	G
				TOT.L PCS THIS PAGE	6		
				TOT.L WGT THIS PAGE	715		

certified to be a true copy.

(b) (6)

(b) (6)

ICDR, USN

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Enclosure (15)

DESCRIPTIONTHE AIRCRAFT.

The R7V is a four-engine, low wing monoplane designed for high-speed, long-range transportation of either personnel, litter patients, or cargo over land or over water. The distinguishing external features are its three vertical fins and rudders, its dual wheel tricycle landing gear, and its characteristically shaped fuselage with the extended nose which houses the AN/APG-42 radar set.

The aircraft is powered by four Turbo-Compound R3350-34 engines, equipped with three-blade, full-feathering, reversible-pitch Hamilton Standard Hydromatic propellers. The flight controls incorporate hydraulic boosters to assist in the movement of the control surfaces, and an automatic pilot is provided for automatic control of the aircraft. The semi-monocoque fuselage is sealed for pressurization between the forward and aft bulkheads. The forward bulkhead separates the flight station from the nose radome; the aft bulkhead is the rear wall of the cabin. All doors in the fuselage sides and the bottom of the fuselage have additional sealing to minimize water leakage in case it becomes necessary to ditch the aircraft.

The interior of the fuselage is divided by the station 260 bulkhead into the flight station and the cabin. Two cargo loading doors, with integral personnel doors, are located on the left side near the forward and aft ends of the cabin. A crew door is located on the right side immediately forward of the station 260 bulkhead. Below the cabin floor are two cargo compartments that are separated by the wing center section.

Crew requirements for overland service include pilot, copilot, flight engineer, and radio operator. Overwater crew requirements, in addition to the four mentioned above, include a navigator, whose station is immediately aft of the station 260 bulkhead, and three relief crew members. In this configuration, a crew bunk is installed on the right side of the aircraft opposite the navigator's station, and a lavatory is installed on the left side aft of the navigator's station.

AIRCRAFT DIMENSIONS.

The over-all dimensions of the aircraft are as follows:

Length	116' 2"
Height (to top of fins)	24' 9"
Height (to top of fuselage)	18' 10"
Wing Span	123' 0"

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DESIGN GROSS WEIGHT.

The design gross take-off and landing weights are 133,000 and 110,000 pounds. The design gross overload take-off and landing weights are 145,000 and 122,000 pounds.

ENGINES

The four engines installed on the aircraft are Turbo-Compound, 18-cylinder, air-cooled R3350-34 engines. The total horsepower output of each engine is increased by the installation of three power recovery turbines, each of which is driven by the combined exhaust from six of the eighteen cylinders. Turbine energy is geared back to the engine crankshaft through a fluid coupling. Turbine speed is proportional to engine speed and requires no control. Each engine also incorporates a fuel injection system, a two-speed supercharger, and a low tension ignition system.

PROPELLERS.

Hamilton Standard Hydromatic, three-bladed, full feathering and reversible pitch propellers are installed on each engine. Each propeller incorporates a fluid anti-icing distribution system. A propeller control system is provided for constant speed, synchronization, individual selector controls, a master control for changing rpm of all engines simultaneously, manual and automatic feathering, and reversing.

DESCRIPTIONENGINE OIL SYSTEM.

Separate oil systems provide lubrication for each engine. Oil flows from the engine oil tank to the engine oil pressure pump, which pumps oil through the engine oil passages. After circulating through the engine, the oil is returned to an engine scavenging pump to the oil radiator for cooling. From the radiator, the oil flows through the return line and back into the engine oil tank. Complete drainage of each system is provided by a drain valve for each tank, a drain plug for each oil radiator, and a drain plug for each engine sump.

FUEL SYSTEM.

Fuel is supplied to the engines from six separate integral wing tanks and a removable, bladder-type, center section tank. All of the tanks are interconnected by a cross-feed line which allows fuel to be supplied from any tank to any engine. Check valves are installed that make it impossible to transfer fuel from one tank to another. Provisions are incorporated for dumping fuel from the integral wing tanks. The cabin heaters are fed from tanks 2 and 3, and the APU fuel supply is taken from tank 4.

FUEL TANKS

The center section tank, tank No. 5, is located between the front and rear wing beams. One fuel tank is located in each outer wing panel and two are located in each inner wing panel. The tank in the left outer wing panel is designated No. 2A and that in the right outer wing panel, No. 3A. The four tanks in the inner wing panels are designated Nos. 1, 2, 3, and 4, in consecutive order, beginning with the tank adjacent to No. 2A in the left wing.

FUEL QUANTITY DATA TABLE. (U.S. GALLONS)

Tank No.	Total Fuel	Unusable Fuel	Usable Fuel Remaining After Dumping
2A (Left Outboard Tank)	565	3	149
1 (Left Middle Tank)	1555	3	145
2 (Left Inboard Tank)	790	16	29
5 (Center Section Tank)	730	7	730
3 (Right Inboard Tank)	790	16	29
4 (Right Middle Tank)	1555	3	145
3A (Right Outboard Tank)	565	3	149
Total Gallons	6550		1376

FUEL SYSTEM INDICATORS.

FUEL QUANTITY INDICATORS. There are eight capacitance-type fuel quantity indicators located on the flight engineer's upper instrument panel. Individual indicators for the seven fuel tanks are provided and a totalizer indicator is provided to indicate the sum total of fuel in all tanks. These indicators show the weight of fuel in the tanks, in pounds.

ELECTRICAL POWER SYSTEM.

The basic electrical system is operated by direct current power sources, and inverters are utilized to provide alternating current power for some of the special items of equipment.

DESCRIPTIONHYDRAULIC POWER SYSTEM.

Four variable displacement hydraulic pumps, one driven by each engine, provide operating power up to 1700 psi for the various hydraulically operated units. The hydraulic power is divided into two systems, the primary and secondary, each of which obtains fluid from the main hydraulic reservoir, located in the left center section leading edge. The reservoir is divided vertically into two compartments up to approximately 2/3 its height and is pressurized with air by means of an aspirator. The reservoir partition divides secondary system fluid from the primary system fluid and each system draws fluid from its respective compartment. The primary and secondary hydraulic power systems are interconnected by means of a crossover check valve which permits the secondary system to supply power to the primary system in the event of partial or total loss of primary system pressure. The primary system cannot supply pressure to the secondary system.

A separate and auxiliary hand pump power system, with its own reservoir, is provided for use in emergency braking or emergency landing gear extension. A pump control valve is installed near each engine-driven hydraulic pump to perform and control multiple system functions. Each valve incorporates a shut-off valve, a thermal relief valve, a pressure relief valve, and a pressure switch, all of which are within the same body.

PRIMARY HYDRAULIC SYSTEM. The primary hydraulic system supplies pressure for operation of the surface control boosters and left wing secondary heat exchanger fan motor. The hydraulic pumps on engines No. 1 and 2 furnish the volume and pressure required for operation of the primary system. Return lines from all primary units are manifolded into a common return line through the main primary filter to the primary return port of the main hydraulic reservoir.

SECONDARY HYDRAULIC SYSTEM. The secondary hydraulic system supplies pressure for operation of the landing gear, brakes, nose wheel steering, wing flaps, tanks No. 2A and 3A fuel dump valves, hydraulic pump for the reserve oil system, and the right wing secondary heat exchanger fan motor. Power for the secondary system is supplied by the hydraulic pumps on engines No. 3 and 4. Return lines from all of the secondary system units are manifolded into a common line through the main secondary filter to the secondary return port of the main hydraulic reservoir.

FLIGHT CONTROL SYSTEM.

The elevators, rudders, and ailerons are actuated by cable and pulley systems which incorporate tension regulators that automatically maintain constant tension in the cable systems. Each outboard rudder, each elevator, and each aileron is also provided with a cable-operated trim tab controlled from the flight station. Hydraulic booster units are built into the elevator, rudder, and aileron cable systems to assist the pilot in moving the control surfaces. The elevator and the rudder booster systems incorporate a complete electrical power unit that will provide an auxiliary source of hydraulic power to the booster assemblies in the event of primary or secondary hydraulic system failure. There is no source of auxiliary hydraulic power for the aileron booster system.

SURFACE CONTROL LOCK.

The effect of surface control locks is achieved by engaging the flight control boosters while the aircraft is parked. The boosters provide sufficient resistance in the system to absorb the impact loads caused by gusts.

PITOT STATIC SYSTEM

The pitot static system includes the pitot system through which impact air pressure is transmitted to the airspeed indicators and the static system through which outside static air pressure is transmitted to the altimeters, air speed indicators, rate of climb indicators, cabin differential pressure indicator, and altitude control of the automatic pilot. Two separate pitot systems are provided, each of which includes a total head installed on the lower fuselage nose. The left total head supplies impact air pressure for the pilot's and navigator's airspeed indicators, and the right total head supplies impact air pressure for the copilot's and the flight engineer's airspeed indicators.

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DESCRIPTION

A. TIMETERS. Five sensitive altimeters are mounted in the aircraft. One is located on the air conditioning control panel and one each is installed in the pilot's, copilot's, flight engineer's upper, and navigator's instrument panels. The altimeters have a range of 50,000 feet altitude and a ground setting scale settable in inches of mercury.

AIRSPED INDICATORS. An airspeed indicator is mounted on the pilot's, copilot's, flight engineer's upper, and the navigator's instrument panel. The airspeed indicators are calibrated in knots.

RATE OF CLIMB INDICATORS. Three instruments indicating vertical speed, climb or descent, are mounted on the pilot's and copilot's instrument panels and the air conditioning control panel. The rate of climb indicator on the air conditioning control panel indicates only the equivalent cabin pressure rate of change. The other two indicators show the aircraft rate of climb or descent.

INSTRUMENTS

Instruments are grouped on the air conditioning control panel and on the pilot's, flight engineer's, and the navigator's instrument panels.

PILOT'S PANEL

Direction Indicator (Flux Gate)
Compass (G-2)
Gyro Horizon-Two
Turn and Bank Indicator-Two
Magnetic Compass
Free Air Temperature Indicator
Clock-Two
Inclinometer

FIRE DETECTION INDICATORS.

MASTER FIRE WARNING LIGHTS AND WARNING BUZZER. A master fire warning light is located in the top center of the pilot's instrument panel and also on the flight engineer's lower instrument panel. The fire warning buzzer is located on the bulkhead behind the copilot's seat. These lights and the buzzer are energized simultaneously by the d.c. electrical system and actuated when one or more fire detector switches close. Each warning light can be tested by pressing its cap.

INDIVIDUAL AREA FIRE WARNING LIGHTS. Fire warning lights for each nacelle are located adjacent to the placarded zone 2 and 3 positions for the engine fire extinguisher selector handle on the flight station side of the station 260 bulkhead. The zone 1 engine fire warning lights are located on the station 260 circuit breaker panel. Fire warning lights for the left and right cabin heater compartments and APU are located adjacent to the cabin heater fire extinguisher selector handle near the floor on the station 260 bulkhead. Each of the warning lights may be pressed to test. The master warning lights on the flight engineer's lower instrument panel and on the pilot's center instrument panel will glow, and the fire warning buzzer will sound whenever one or more of the area warning lights are energized, either for test or by fire.

FIRE EXTINGUISHING SYSTEM.

A two-shot fire extinguishing system is installed to extinguish fires in engine zones No. 2 and No. 3, cabin heater compartments, and the APU. In addition to this system, three portable hand-operated carbon dioxide fire extinguishers are provided.

The fire extinguishing system consists of two separately controlled groups of three 12.5 pound cylinders of carbon dioxide, operating heads, two selector valves, cable controls, and a distribution system.

DESCRIPTION

EMERGENCY EQUIPMENT

Ditching Safety Belts
Emergency Lights
Fireman's Hand Axe
First Aid Kits-Four
Flashlights-Six
Ladders-Two

Life Rafts. One 20-man life raft is installed in the right inner wing, outboard and aft of the inner nacelle, and two 20-man life rafts are installed in the left inner wing inboard and outboard of the inner nacelle. In addition, aircraft converted for overwater passenger or litter usage have three 12-man life rafts strapped to the cabin ceiling aft of the net on the right sidewall and one 12-man life raft located aft of the navigator's station.

Life Raft Radio Transmitters. Two life raft radio transmitters are provided for aircraft converted for overwater usage. One is located forward of the aft cabin door and the other is located aft of the crew bank. These transmitters are provided for emergency use.

Pyrotechnic Equipment. A pyrotechnic pistol and container for carrying twelve rounds of ammunition are clipped to the navigator's book box. A mount is provided for firing the pyrotechnic pistol and is located in the ceiling of the fuselage aft of the navigator's station.

AE/rjk
10 November 1954

AAR Board document in the aircraft accident involving RTV-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

PERTINENT DISCREPANCIES NOTED ON BUREAU NUMBER 128441

10-29-54

1. #4 BMEF gauge sticks and very sluggish.
ACTION: Replaced transmitter, indicator checks OK.

10-26-54

1. #10 and #8 plugs bad on #2 engine, left distributor.
ACTION: Changed plugs.
2. Re-time #2 analyzer generator, shows half pattern, then full pattern and then another half pattern.
ACTION: Re-timed #2 analyzer.
3. Check #1 engine for fire.
ACTION: No signs of fire in engine nacelle.

10-25-54

1. Antenna and loop position out on Green ADF.
ACTION: Repaired broken lead-in at "T" on Green ADF sense antenna and replaced cracked 1L7U insulator on red ADF sense antenna.

10-23-54

1. UHF is very noisy.
ACTION: Replaced UHF.

10-19-54

1. #3 engine fuel pressure stays at 31 "in cruise, boost on low. Boost high 34". Boost OFF 32".
ACTION: Turned down engine fuel pressure 2 turns.
2. Two bolt heads sheared, all other bolts loose on #2 hydraulic pump adapter.
ACTION: Replaced all bolts #2 hydraulic pump to adapter.
3. Check for cracked line on "B" nut on starboard main gear hydraulic up-line at head of gear actuating cylinder. "B" nut has been tightened several times - still leaks.
ACTION: Hydraulic line and "B" nut are OK. Union between "B" nut and manifold block on cylinder was loose. Tightened union.
4. Pilot's #1 and #2 tachometer fluctuates about 50 RPM.
ACTION: Changed indicator.
5. #3 engine went to 2985 RPM on take-off. Previously went to 2825 RPM.
ACTION: Turned high RPM down two (2) turns.

Enclosure (17)

10-19-54 Continued

6. Co-pilot's radio selector inoperative.
ACTION: Replaced co-pilots radio box.
7. #3 Hydraulic low pressure warning light does not light up when by-passed.
Pilot's works OK. F/E test bulb - OK.
ACTION: Re-soldered broken lead back of #3 warning light.
8. Green bird dog antenna lead into belly needs new connection.
ACTION: Replaced connection for Green DF antenna.

10-2-54

1. #3 fuel pressure fluctuates 2-5 P.S.I. with boost on.
ACTION: Changed transmitter.
2. Altitude control inoperative.
ACTION: Adjusted hair spring insides auto-Pilot amplifier. Altitude control is awaiting Lockheed fix.
3. #3 engine emergency shut-off lever works very hard.
ACTION: Checked cable tension. Works no harder than #4.
4. #3 BMEP gauge fluctuates 2-4 BMEP.
ACTION: BMEP transmitter "On Order".

9-28-54

1. #3 oil out temperature 2° low.
ACTION: Tightened loose leads.
2. Have to de-pressurize manually; cannot control rate of descent on "automatic"; rate of descent goes from 200 to 2000 feet per minute.
ACTION: Replaced altitude selector and landing gear scissors switch.

9-20-54

1. Cannot pressurize on "automatic"; rate of change pegs 2000 feet per minute.
ACTION: Changed sensing head on out flow valve.
2. #3 boost pump pressure fluctuates.
ACTION: Changed transmitter.
3. Door warning light came "on" in flight.
ACTION: Replaced bulb and adjusted micro-switch on crew compartment door.
4. No. 2 engine generator 50 amperes lower than No's 1, 3, and 4 engine generator.
ACTION: Replaced #2 generator.
5. No. 2 engine, right distributor shows cylinders 3, 11, and 4 intermittently arcing open and wavy.
ACTION: Changed right distributor on #2 engine.

9-20-54 Continued

6. 7 to 8 BMEF drop, right magneto #3 engine on 30" check.
ACTION: Changed #5 cylinder booster coil and front plug.

9-14-54

1. Cabin pressurization will not change altitudes automatically.
ACTION: Replaced altimeter selector and rate of change.
2. Disconnected #1 cabin supercharger due to low oil pressure warning.
ACTION: Refilled oil reservoir.
3. #3 fuel pressure and fuel flow fluctuates excessively; BMEF also fluctuates from 3 to 6 BMEF.
ACTION: Changed engine driven fuel pump.
4. Unable to control #1 propeller on automatic sync.
ACTION: Changed Sync box.
5. Co-pilot's J-16 box no good when mike is plugged in, cuts out radio.
ACTION: J-16 OK, replaced bad mike.
6. UHF too noisy to read.
ACTION: Replaced UHF.

9-8-54

1. #2 engine left distributor shows bad brush arcing.
ACTION: Polished segments.
2. #2 and #3 engine has 5 BMEF drop on both distributors.
ACTION: Distributors were checked and found to be firing 28° BTC, as per spark lock-out evaluation. Spark plug leads and all fuel injection nozzles were inspected for security. Injection pumps timed correctly. Could not find anything wrong.
3. Cannot "push to test" #3 oil pressure or #4 fuel pressure light.
ACTION: Replaced bulbs.
4. #4 engine cabin supercharger leaking oil badly in switch assembly.
ACTION: Installed new low pressure warning light assembly.
5. #3 engine went to 2975 RPM on T.O.
ACTION: Decreased RPM 1½ notches.
6. #3 oil temperature inlet 75°, outlet 70°.
ACTION: Changed outlet temperature bulb.
7. Auto pilot and both gyros went out.
ACTION: Replaced fuse.

Enclosure (17)

MEM/rjk
10 November

9-8-54 Continued
8. UHF transmitter out.
ACTION: Replaced UHF.

(b) (6) LCDR, USN

Certified to be a true copy.

(b) (6)

(b) (6) LCDR, USN

4

Enclosure (17)

77

FIRST LOGISTIC AIR WING, ATLANTIC CONFIDENTIAL
AIR TRANSPORT SQUADRON ONE
U. S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

Aircraft Type R7V Aircraft BuNo. 121-471

In readiness for (test) (scheduled) (pilot training) flight.
(Strike out the one that does not apply).

This airplane was logged at 43.1 hours since previous
FAT checks.
(specify)

Vital shift attached (b) (6)
(b) (6) (inspector)
(b) (6)

Radio pre-flighted by D. H. M.

Released from T. H. L.

W/ pre-flighted by None Needed

D. H. discrepancies worked off (b) (6)
(inspector)

IF FOLLOWING DISCREPANCIES HAVE NOT BEEN CORRECTED,

(b) (6)

Date 10-20-54

(b) (6)

(b) (6)

(Signature) (Inspector Duty Officer)

1	DATE	TIME
2	DATE	TIME
3	DATE	TIME
4	DATE	TIME

300/rjk
10 November 1954

WAR Board document in the aircraft accident involving R7V-1 Bureau Number 120441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

COM FLOW

FLEET LOGISTIC AIR WING
R7V FUEL LOADING INSTRUCTIONS

R7V - 441
1935 10-30-54

TRIP NO	441	DATE	10-30-54	TANK		
FROM	BTD	TO		LEFT OUTD #2.	505	505
TIME REQ		TIME DEL 1900		LEFT CENTER 1	1555	1555
FUEL TRUCK NO	S600016	LE/G.L FUEL		LEFT INED 2	790	790
DELIVERED BY	THORNBURG & SWICEGOOD			RIGHT 5	730	400
M.S. BY	ALIEN & HANSEY			RT INED 3	790	790
C.A.F.S SECURED BY	ALIEN, HANSEY			RT CENTER 4	1555	1555
				RT OUTD 3.	505	505
				TOTAL INED	6550	6220
				LESS WARM-UP		
				AND TAXI		
				TOTAL TAKE-OFF FUEL		

ENGINE OIL						
NO	1	2	3	4	RESERVE	TOTAL
C.P	40	40	40	40		
REQ	35	35	35	35	65	205
DEL						

SPECIAL INSTRUCTIONS

/s/ (b) (6)

Certified to be a true copy.

(b) (6)

(b) (6)

CDR, USN

Enclosure (19)

20

ENCLOSURE 20: FLIGHT LOG BOOK

Has been deleted from filming since it is not pertinent to the accident.

AAR Board document in the aircraft accident involving R7V-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6), USN, which occurred on or about 31 October 1954.

GENERAL HISTORY OF AIRCRAFT

This aircraft, designated R7V-1 Navy Bureau Number 128441, (LAC Serial Number 4108), was accepted by the U.S. Navy from Lockheed Aircraft Corporation, Burbank, California on 23 May 1953, and arrived NAS, Patuxent 27 May 1953.

Total times are as follows:

UNIT	BUNO/SER NO.	TIME
Airframe	128441	1362.4 hrs.
	(Time since TEMCO 1st O/H)	504.4 hrs.
ENGINES		
1. R-3350-34	W-580113	516.3 hrs.
2. R-3350-34	W-580110	518.2 hrs.
3. R-3350-34	W-580111	512.2 hrs.
4. R-3350-34	W-580112	512.9 hrs.
Power Recovery Turbines, No. 1 Engine		
1. PRT	WA-2841	504.7 hrs.
2. PRT	WA-4479	504.7 hrs.
3. PRT	WA-5947	504.7 hrs.
Power Recovery Turbines, No. 2 Engine		
1. PRT	WA-2453	504.7 hrs.
2. PRT	WA-2508	504.7 hrs.
3. PRT	WA-2550	504.7 hrs.
Power Recovery Turbines, No. 3 Engine		
1. PRT	13456	221.9 hrs.
2. PRT	FAD-1310	375.7 hrs.
3. PRT	FAD-1340	683.5 hrs.
Power Recovery Turbines, No. 4 Engine		
1. PRT	WA-3021	504.7 hrs.
2. PRT	WA-15921	221.9 hrs.
3. PRT	WA-2857	513.2 hrs.
Propeller (No. 1 Engine) 43E60-305		674.2 hrs.
1. Hub	179410	
2. Blade	598039	
3. Blade	598040	
4. Blade	598041	

Enclosure (21)

REN/rjk
10 November 1954

Propeller (No. 2 Right) 43240-9

1271.0 hrs.

SN
173325
SN
572897
SN
572897
SN
572891

Propeller (No. 1 Right) 43256-305

673.8 hrs.

SN
173408
SN
598031
SN
598034
SN
598035

Propeller (No. 1 Left) 43246-7

1270.6 hrs.

SN
173401
SN
573960
SN
573961
SN
573962

Propeller (No. 2 Left) (SN 70-3) 11,2-26.

77.7 hrs
10 starts

Since May 27, 1953, the delivery date of subject aircraft, it was used for experimental service test for approximately 840 flight hours.

This aircraft was sent to OAS, Norfolk, Va., January 4, 1954, for repair. Primary and Secondary Hydraulic system contaminated with metal caused by failure of No. 2 engine driven hydraulic pump and returned to VR-1 January 27.

On another inspection about 25 October 1953 a crack was found in the left wing spar web at wing station 285 where the after cooler actuator motor hook is attached to the web.

Repair of subject failure was made at Lockheed by installing an hour glass crack repair damaged area and installing an additional bolt attachment for the after cooler actuator motor hook structure at wing station 287 to preclude rear spar web cracking. (See SER Serial No. 246-53 dated Oct 1953 refors.)

Engine sent to RJA, Dallas, Texas February 1, 1954 for first cycle progressive maintenance including complete overhaul of hydraulic system. Returned 1 May 1954.

Assembly project of the wing integral fuel tank in process 30 Oct 1954 on all Lockheed Model Aircraft. This project is supervised by Lockheed personnel. Subject aircraft was not one of those completed.

An inspection of the automatic spark lock-out was being conducted on No. 1 engine. After approximately 135 hours of operation, no adverse effects were observed. The automatic spark was locked out approximately October 1, 1954. (See SER Serial No. 246-53 dated 11r HX, nk/F12 ser 1624 of 13 August 1954.)

AEM/rjk
10 November 1954

Grimes Rotating Beacon and Grimes instrument panel lighters installed by
Electronics Test Division, NATC, Patuxent River, Maryland for evaluation
purposes June 1954.

(b) (6)

(b) (6)

LCDR, USN

Certified to be a true copy.

(b) (6)

(b) (6)

LCDR, USN

R7V #8441 Pilot Leonard

DATE	PERIOD
30 October 1954	30/0130Z to 31/1230Z
FLIGHT 124 Spl	of VR-1
To GP	VIA GC
ROUTE FORECAST	

SYNOPSIS: Low near Anticosti Island with secondary low 100 miles SE of Nantucket moving NE at 20 knots. Cold front from second low SSW along 69 West then SW to Nassau. Low at 39 North 41 West with rough NNE and cold front SSW. Warm front SE from low to 33 N 30 West. Low moving East at 10 to 15 miles per hour.

WEATHER: Snow and rain aloft in low off Nantucket with some sctd thunderstorms. Rain in warm sector of low and along warm front. Clouds in layers 10 to 12 ft., tops 60 to 80 ft., layer 80 to 90 feet, tops 100 to 150 feet, few tops to 200 ft. in first system. Low near 40 west broken cloudiness at 30 to 40 ft., tops 80 to 100 ft., layer 90 to 100 ft., tops 130 to 150 ft.

ICING: Mod. only hvy mixed icing in clouds and precip. above freezing level.

TURBC: Mod. to 60 ft. in cold front, Mod. to heavy in and around buildups.

	NHK / 70W	70W / 60W	60W / 50W	ALDFT 50 / 40W	40 / 30W	30 / GP
11	250/30	220/30	230/20	270/10	140/10	030/08
15	230/40	220/45	230/25	300/10	180/05	360/05
19	230/50	220/55	240/25	320/10	320/10	330/08

TERMINAL FORECAST	
TERMINAL	GP SMA
SEY CONDITION	12 Sctd 20 brkn 18 sctd 25 brkn
VISIBILITY	10 miles 15 mi
WEATHER	Inter 5 RW- Inter 14 sctd 5RW
SURFACE WIND	180/15 030/12

FORECAST PREPARED BY:

FORM-8-12-47-54

(b) (6)

ENCLOSURE (2)

AAR Board document in the aircraft accident involving R7V-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

AEH/rjk
10 November 1954

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

LMN:2:jht
F20 2254
23 Sept 1954

From: Commanding Officer
To: Chief, Bureau of Aeronautics
Via: Commander, Fleet Logistic Air Wing Atlantic/Continental

Subj: Leaks in Integral Fuel Tanks, R7V-1 type aircraft

Encl: (1) Three photographs of tank access plate of R7V-1 BuNo 1331633
(2) Fuel leak survey chart (two sheets)

1. This squadron has recently experienced an unusually large number of leaks from the integral fuel tanks of the R7V-1 type aircraft assigned. Having caused a delay in eight different flights during the month of August, this problem has already greatly impaired the efficiency of flight operations. This unsatisfactory condition is becoming progressively more serious as time passes and it is considered imperative that corrective action be taken immediately.

2. The fuel leaks experienced are all wing tank leaks and are well dispersed throughout the tank areas. It is the opinion of this squadron that a major portion of these leaks are the direct result of the improper application of fuel tank sealing compounds by the factory. Enclosure (1) shows the condition of the sealing compounds on one of the access plates of an R7V-1 fuel tank. The darker, glossy areas shown in the photographs are those areas where the basic sealing compound has been properly protected from the effects of aromatic fuels by the coating of LAC Material Spec 1-731 (E.C. 776). The light, chalky textured areas are those surfaces which were not properly treated and represent chalky, powdery material which has lost all sealing qualities. This condition prevails to a varying degree throughout the tank interiors of all aircraft inspected.

3. To further show the nature of sealing defects encountered the following detailed discrepancies, found in four tanks recently opened for repair of leaks, are cited:

a. R7V-1 BuNo 131635, tank number 34.

(1) The aft inboard corner vertical seam had not been treated with E.C. 776.

(2) The aft upper corner had not been treated with E.C. 776 from the inboard end to approximately three feet outboard.

Enclosure (23)

REK/rjk
10 November 1954

FF12/VR-1/LMN:2:jht
F20

(3) The inboard upper corner had not been treated with E.C. 776 from the aft end to approximately one foot forward.

(4) A total of about ten to twelve feet of additional rivet lines and joints in this general area had not been treated with E.C. 776.

(5) From the one access hole sixteen other small untreated areas were detected.

(6) The access cover plate and fuel pump mount were badly spotted.

b. R7V 131639

(1) In tank number one, at least twenty-seven spots of varying size had not been treated with E.C. 776.

(2) In tank number four, eight small spots had not been treated with E.C. 776.

(3) In tank number one a, nineteen spots ranging from one inch diameter to two and a half feet long had not been treated with E.C. 776.

4. Enclosure (2) is a chart depicting frequency of gas leaks encountered in various aircraft assigned this squadron from February 1954 through 26 August 1954, and shows a total of forty-four leaks.

5. A summary of factors bearing on gas tank leaks in R7V-1 aircraft assigned is:

a. Nearly every aircraft has developed gas leaks in at least one integral tank.

b. Every fuel tank opened shows evidence of improper application of sealant by the manufacturer.

c. The frequency of gas leaks appears to increase as time of the aircraft in service increases.

d. Repair of gas leaks imposes a substantial burden on assigned maintenance personnel the number of which has recently been drastically reduced.

e. Leaks occur without warning and cannot be predicted, thereby seriously delaying planned utilization of aircraft.

f. From 1 August 1954 through 21 September 1954 a total of twenty-eight leaks have occurred in tanks of R7V-1 aircraft assigned.

g. Repair of a gas tank leak necessitates putting the aircraft out of commission for an average of eight hours.

h. A serious shortage of hangar space available to this squadron will make gas tank leak repair a much more difficult and time consuming problem during the oncoming cold weather months. Re-sealing operations cannot be done below an ambient temperature of 70°F.

6. It is recognized that the type tank used in the six wing tanks of the R7V-1 may well give an inherent tendency to leak. If so, this condition is greatly aggravated by the general condition of inferior applications of tank sealant. The unsatisfactory sealant problem can best be corrected by removal of all unsatisfactory sealant and proper application of new as a planned operation. The magnitude and technical aspects of this task is beyond the proper scope of squadron maintenance.

7. It has become quite apparent that the poor condition of sealant is general throughout all assigned aircraft; it is equally apparent that the frequency of leaks will increase and that the repair as occurring procedure now in effect is an unsatisfactory solution. Even at the present state of aggravation, the squadron cannot sustain operations at a satisfactory level with respect to aircraft availability and reliability.

8. It is strongly recommended that the Lockheed Aircraft Corporation send to VR-1 a team of men with the necessary materials to examine all integral tanks in R7V-1 aircraft assigned, to remove all improperly applied and/or deteriorated tank sealant and re-seal satisfactorily. In this connection, available hangar space as stated above is critical. Hence the size of the team provided should be large enough to enable completion of the work prior to arrival of winter weather which will preclude efficient outdoor work, estimated to be about 1 December. If it is not feasible to do this work at Ratuxent River under these conditions it is suggested the aircraft be ferried to a suitable repair site on an accelerated schedule. In any event the early completion of this work is considered essential to a satisfactory level of operations.

C. F. GARRISON

Copy to:
BUAER (Advance Copy)
BAR, Burbank
VR-8

Certified to be a true copy.

(b) (6)
(b) (6)

LTDR, USN

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

14 September 1954

MEMORANDUM

From: Maintenance Duty Officer (LT (b) (6))
To: Maintenance Officer

Subj: Interior inspection of R7V Integral on 131635 and 131639
fuel tanks; report of

1. In compliance to your request I inspected the interiors of the four fuel tanks that were open today for gas leaks. This inspection covered only such areas as were visible from the open access hole. The following discrepancies were detected.

a. R7V 131635, Tank 3a.

- (1) The aft inboard corner vertical seam had not been treated with E.C. 776.
- (2) The aft upper corner had not been treated with E.C. 776 from the inboard end to approximately 3 feet outboard.
- (3) The inboard upper corner had not been treated with E.C. 776 from the aft end to approximately 1 foot forward.
- (4) a total of about 10 to 12 feet of additional rivet lines and joints in this general area had not been treated with E.C. 776.
- (5) From the one access hole 16 other small untreated areas were detected.
- (6) The access cover plate and fuel pump mount were badly spotted.

b. R7V 131639

- (1) In tank #1 at least 27 spots of varying size had not been treated with E.C. 776.
- (2) In tank #4, 8 small spots had not been treated with E.C. 776.
- (3) In tank #1a, 19 spots ranging from 1" diameter to 2 1/2 feet long had not been treated with E.C. 776.

2. From the condition of the tanks it is evident that the application of E.C. 776 was not properly completed. Some of the small areas were around projections where the E.C. 776 had been brushed in one direction only thereby not touching one side of the projection. The larger areas had not been treated with E.C. 776 at all. Since only one access plate was removed from each tank the entire interior could not be inspected. I am convinced that many more untreated areas exist that could not be detected on such superficial inspection.

Certified to be a true copy.

(b) (6)

(b) (6)

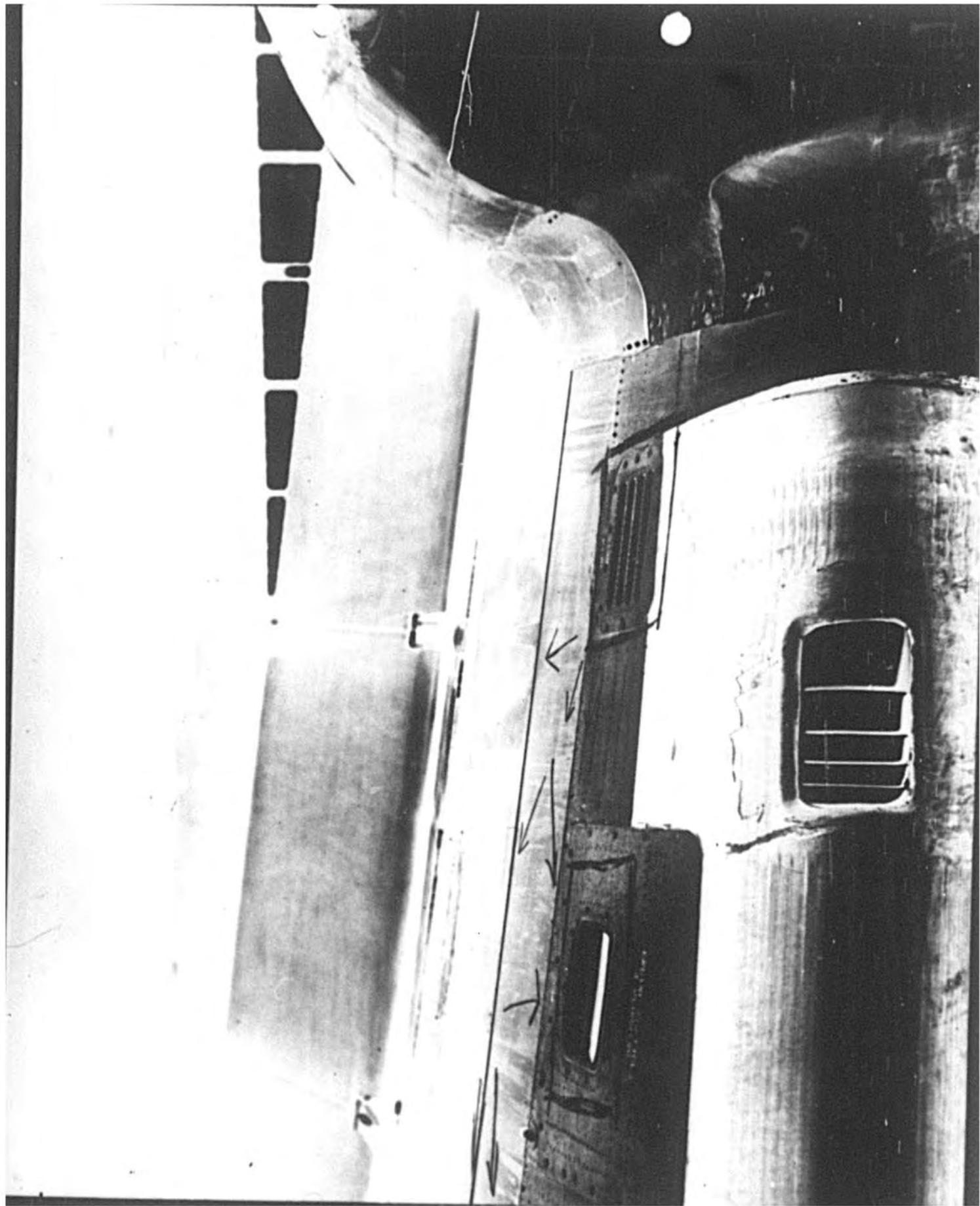
LT USN

ENCLOSURE (3)

(b) (6)

LTJG, USN

Enclosure (23)



FF12/FlogWingLant/Cont1
EFP:rre/F2
Serial: 950
10 MAY 1954

FIRST ENCLOSURE on CO, VR-1 ltr ser 766 dtd 12 April 1954

From: Commander, Fleet Logistic Air Wing, Atlantic/Continental
To: Chief, Bureau of Aeronautics

Subj: Accelerated Service trials Model R7V-1 Aircraft; final report on

Ref: (c) DuAer ltr ser 172535 dtd 13 Dec 1952
(p) CorFlogWingLant/Cont1 ltr ser 25 dtd 8 Jan 1953

Encl: (7) CorFlogWingLant/Cont1 ltr ser 39 dtd 8 Jan 1954

1. Forwarded.

2. Reference (c) outlined a recommended service test program of one (1) R7V-1 aircraft assigned by Commander, Fleet Logistic Air Wing, Atlantic/Continental to Air Transport Squadron One for operation.

3. Reference (p) concurred in the recommendations of reference (c) and by reference (b) directed Air Transport Squadron One to conduct the service test evaluation.

4. The R7V-1 airframe and turbo-compound engine combination is basically very satisfactory and desirable for its military transport mission and is a decided improvement over previous transport models. However certain features that the aircraft presently possesses are considered entirely unreliable and because of these the aircraft cannot be considered completely satisfactory operationally. The following items in this report render the aircraft unsatisfactory from an operational viewpoint or marginal from a safety standpoint:

- a. A notably unreliable power plant (paragraphs 16(b), 20(a), 34(b) refer).
- b. Unreliable wing flap system (paragraphs 17(i), 33(e) refer).
- c. Hydraulic system deficiencies (paragraphs 17(n), 21, 34(f) refer).
- d. Unreliable landing gear down lock mechanism (paragraph 17(c) refers).
- e. Inadequate fire protection equipment (paragraph 33(bb) refers).
- f. Lack of passenger emergency warning systems (paragraph 33(t) refers).
- g. Auxiliary power unit (GFP-70) discrepancies (paragraph 34(n) refers).

ENCLOSURE (26)

Subj: Accelerated Service trials Model R7V-1 Aircraft; final report on

5. It is noted that electronic deficiencies are not covered in this evaluation. The following specific deficiencies have been noted which affect operations of long range type aircraft:

a. ADF System: The dual AN/ARN-6 radio compass system is considered inadequate in that it does not function properly during precipitation static conditions. This is considered unsatisfactory in air transport operations.

b. HF Communication Equipment: Only one HF transmitter is installed. Dual HF transmitters are considered a requirement for long range overwater operations for proper conduct of operational air/ground communications.

c. VHF System: Only one AN/ARC-1 VHF transceiver is installed. This receiver is considered inadequate for world wide operations. Approximately sixty crystals are needed to channelize this receiver on a world wide basis. In addition, the AN/ARC-1 is approaching its life expectancy and is becoming increasingly difficult to maintain. Therefore it is recommended that dual multi-channel VHF transceivers with a continuous tuning feature in the VHF frequency range of 116 mc to 145 mc tuned in .05 mc steps be installed in the R7V-1 aircraft. Dual transceivers of the above type will insure proper communications for conducting air transport operations any place in the world.

d. G-2 Compass System: This compass is unreliable for high latitude operations. As this compass is installed on the pilot's panel it should be wired to the emergency electrical system so it may be available for use in the event of a main bus electrical failure.

c. Antenna Systems:

(1) Difficulty has been experienced trying to load the AN/ART-13/HF transmitter on the 90 foot fixed antenna installed for this transmitter. A trial antenna 45 feet long has proven to be much more efficient.

(2) The location of the UHF and VHF antenna causes loss of communications with these equipments during GCA approaches and in the landing pattern.

f. Anti-precipitation Wicks: It is believed that this aircraft has too few anti-precipitation wicks installed which evidences itself in high static conditions introduced into the ARN-6, ARC-5, and ARN-4 receivers. This reduces the effective range of the above equipments even though static conditions are light. In medium to heavy static the operation of the above equipments are entirely unsatisfactory.

Enclosure (7) which outlines the operational requirements for electrical and electronic systems in Navy long range transport type aircraft was submitted to the Chief of Naval Operations on 8 January 1954.

Subj: Accelerated Service trials Model R7V-1 Aircraft; final report on

It is recommended these requirements be reviewed for possible incorporation in the R7V-1 in order to make the aircraft more satisfactory for long range transport operations. Of immediate importance in order to permit world wide operations of the R7V-1 is the replacement of the G-2 compass system with a system that will enable the aircraft to operate in regions requiring the use of polar grid navigation.

6. To improve the suitability of the R7V-1 aircraft, it is strongly recommended that the discrepancies and deficiencies reported in this and previous reports, on which corrective action has not already been taken by the Bureau of Aeronautics, be expeditiously corrected.

Copy to:
CO, VR-1 (w/encl)

J. I. TAYLOR

Certified to be a true copy.

(b) (6)

(b) (6)

LCDR, USN

FINAL REPORT
OF THE
ACCELERATED SERVICE TRIALS
ON THE
NAVY MODEL R7V-1 AIRCRAFT

CONDUCTED
BY

AIR TRANSPORT SQUADRON ONE
N.A.S. PATUXENT RIVER
MARYLAND

(b) (6)

Lcdr USN

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ENCLOSURE 20

R7V-1 SERVICE TEST

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FLEET LOGISTIC AIR WING, ATLANTIC/CONTINENTAL
AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

FF12/VII-1/KRM:13:rr1
F1
Serial: 766
12 April 1954

From: Commanding Officer, Air Transport Squadron One
To: Bureau of Aeronautics (AC-60)
Via: Commander, Fleet Logistic Air Wing, Atlantic/Continental
Subj: Accelerated Service trials Model R7V-1 Aircraft; final report on

Ref: (a) Bureau of Aeronautics (AC-60) Disp 192125Z of May 1953
(b) Commander, Fleet Logistic Air Wing, Atlantic Disp 291503Z of May 1953
(c) Lockheed Aircraft Corporation Proposal for Service Test Program Model R7V-1 dtd 13 Mar 1953
(d) Air Transport Squadron One ltr ser 1594 dtd 2 July 1953
(e) Air Transport Squadron One ltr ser 1932 dtd 10 Aug 1953
(f) Air Transport Squadron One ltr ser 2266 dtd 30 Sept 1953
(g) Air Transport Squadron One ltr ser 2473 dtd 30 Oct 1953
(h) Inspection Requirements Handbook for Navy Model R7V-1 Aircraft (AN 01-75 CM-6)
(i) Handbook of Maintenance Instructions for Navy Model R7V-1 Aircraft (AN 01-75 CMA-2)
(j) Handbook of Structural Repair Instructions for Navy Model R7V-1 Aircraft (AN 01-75 CM-3)
(k) Flight Handbook for Navy Model R7V-1 Aircraft (AN 01-75 CM-1)
(l) Detail Specification for the Model R7V-1 Airplane Class VR Transport Landplane AD-480A dtd 18 March 1953
(m) Air Transport Squadron One Disp 222122Z of Dec 1953
(n) Report of Electronics Test Progress, Electronics Test Division ltr ET 22005 ser 1-54 of 5 Jan 1954

Encl: (1) Replacement Parts Usage
(2) Flight Summary R7V Service Test Operations
(3) List of Reports of Unsatisfactory or Defective Material
(4) Flight Data Form (blank)
(5) Inspection Forms (blank)
(6) Intermediate Cruise Charts

INTRODUCTION

1. Reference (a) requested that representatives of Commander, Fleet Logistic Air Wing, Atlantic/Continental, Air Transport Squadron One, Supply Department U.S. N.S., Patuxent River, Lockheed Aircraft Corporation and Aviation Supply Office be present at a meeting at the Bureau of Aeronautics on 27 May 1953 to discuss the Service Trials of the R7V-1 Aircraft. As a result of the conference and by reference (b), Commander, Fleet Logistic Air Wing, Atlantic/Continental ordered

the Commanding Officer, Air Transport Squadron One to commence a service test program on 1 June 1953 using R7V-1 BuNo 128441 as the test vehicle; Reference (b) further directed that reference (c) be used as a guide in conducting the service trials. Due to an extended period of maintenance resulting from hydraulic system contamination the service trials were terminated on 22 December 1953, by reference (m).

2. This is the final report of the R7V-1 Service trials. References (d) through (h) contain detailed accounts of early phases of these trials. Reference (n), although not part of the service test, contains information relative to the electronics evaluation of an R7V-1 type aircraft.

DISCRIPTION OF AIRCRAFT TESTED:

3. The model R7V-1 airplane is an all-metal low wing monoplane, powered with four R3350-34 radial engines equipped with reversible pitch propellers. It is designed for the transportation of personnel and cargo, and is capable of carrying 97 passengers, plus a crew of eight. The main crew and lower cargo compartments are pressurized. The all-metal full-cantilever stressed-skin wing consists of inner and outer panels and wing tips. The nacelles and flaps are incorporated in the inner panels; the ailerons, with trim tabs, in the outer panels. The empennage is of all-metal construction incorporating three fins and rudders which are attached to the full-cantilever stabilizer. Elevator and elevator trim tabs are all-metal, while the rudders and rudder trim tabs are fabric covered. The hydraulically operated landing gear consists of a double-wheel nose gear and two double-wheel main gears. All gears are completely enclosed by doors when retracted. A more detailed discription of this aircraft can be found in reference (1).

RECORD OF TRIALS:

4. The following is a chronological record of trials:

Project initiated27 May 1953
Project Aircraft R7V-1 BuNo 128441 received27 May 1953.
First Project flight 1 June 1953
Aircraft Grounded pending results of investigation of accident on
7 July 1953 - R7V BuNo 128447.
Project flights resumed30 July 1953.
Grounded due to lack of Power Recovery Turbine flight hoods 12 -
19 Aug 1953.
Aircraft down for maintenance due to Boost system & cracked web
left rear beam discrepancies30 Sept 1953.
to 10 Oct 1953.
Aircraft grounded due to hydraulic system contamination 13 Dec 1953.
Project terminated22 Dec 1953.

PURPOSE OF TRIALS:

5. The purpose of the accelerated service trials on the R7V aircraft was to obtain operational and service information based on aircraft operation simulating as closely as possible the normal missions on which this aircraft is to be employed. The information thus obtained is to be used in determining the reliability of equipment, performance characteristics, servicing problems, and spare parts usage data.

METHOD OF TRIALS:

6. During the Accelerated Service Trials, R7V-1 BuNo 128441 was flown 120 flights for a total of 860.0 hours. Flights were from three tenths of an hour to 12.6 hours in duration with an average of 7.1 hours per flight. With the exception of three ferry flights and 25 test flights, all flights utilized the aircraft as a transport, carrying passengers and cargo, on regular and special flights fulfilling the mission of this squadron. The aircraft was flown in the normal transport configuration over various routes at various altitudes. Throughout the trials the aircraft was flown at an average gross take-off weight of 122,976 pounds. The maximum gross take-off weight during the trials was 133,017 pounds and the maximum gross landing weight was 119,197 pounds.

7. The following engines were installed or changed during the accelerated service trials:

POSITION	R-3350-34 ENGINE SERIAL NUMBER	TOTAL PROJECT TIME	TOTAL ENGINE TIME	CAUSE OF FAILURE
1.	W532514	531.7	565.0	Changed due to damaged impeller blade
2.	W546962	455.0	488.3	Changed due to impeller drive failure
4.	W546965	363.2	395.5	Changed due to broken #3 exhaust valve
1.	W580010	340.7	340.7	Presently Installed
2.	W580007	416.0	416.0	" "
3.	W546963	831.6	864.9	" "
4.	W580046	525.8	525.8	" "

8. Engine powers used during the accelerated service trials were as follows:

Take Off power 4.65 hrs.
METO 8.05 hrs.

Climb Power	97.30 hrs.
Maximum Cruise Power (66% of cruise flight)	502.00 hrs.
Intermediate Cruise (8.1% of cruise flight)	62.00 hrs.
Long Range Cruise (24.8% of cruise flight)	186.00 hrs.

NOTE: Power settings for the various regimes of flight were in accordance with the recommended power settings of Appendix I of reference (c).

9. All essential engine instruments were calibrated on 1 June, 5 October and 10 December 1953 by Lockheed Aircraft Corporation, and engine operation data was recorded at appropriate intervals during the operation of each flight on data sheets (Encl (4)). Instrument readings were recorded during idle, taxi, run-up, take-off, METO climb, climb in low blower, and climb in high blower. Readings were also taken periodically during cruise and at each power or altitude change. Copies of this data were forwarded to the Lockheed Aircraft Corporation and the Wright Aeronautical Corporation for reduction and assimilation in accordance with reference (c).

10. Routine pre-flight inspections were performed prior to each flight. Postflight inspections were made after approximately every 40 hours of flight time. Intermediate inspections were made after every 100 hours of flight time. Major inspections were performed after 100 hours of flight time following every second intermediate inspection. Enclosure (5) contains copies of the inspection forms used in conducting these checks.

11. An appraisal of references (i) and (j) has been made to determine the accuracy of the publications and their adequacy for use by an operational squadron. Since all maintenance operations are performed by naval enlisted personnel both rated and non-rated, simplicity and clarity are of utmost importance. It has been found that these two qualifications were met satisfactorily. The practice of having Lockheed and other company representatives on the scene to explain systems, drawings, or practices has proved to be immensely helpful. This practice is standard procedure and should by all means be continued. By and large the content, presentation, and scope of references (i) and (j) meet the maintenance requirements of this squadron for mechanical upkeep of the aircraft.

12. Reference (i) contains instructions and directions pertinent to the maintenance of the R3350-34 engine. This section, along with the engine bulletins published from time to time, has been appraised and has been found adequate in all respects and has been used successfully. In this connection it is note worthy that the Handbook of Overhaul Instructions published under the direction of the Wright Aeronautical Division is a very informative piece of literature replete with diagrams and pictures which are especially valuable to engine maintenance personnel in their work of a non-routine nature including engine build-up. That this publication be made available in quantity to operating units is highly recommended.

13. A carbon monoxide survey was conducted using the Colorimetric bulb type Indicator Mark II to determine the presence of CO contamination in the cockpit and cabin, results are given in paragraph 26.

14. Replacement parts usage for the R7V-1 aircraft BuNo 128441 was accurately recorded and is listed in enclosure (1). This list should be useful in determining spare parts requirements.

15. Removal and replacement time trials and interchangeability requirements were not studied on this aircraft.

16. Oil consumption data was recorded during the trials for the purpose of determining the oil consuming characteristics of the power plants. Two factors render the results as approximations, namely (1), oil temperatures were not observed at the time of measurement, and (2), the majority of the flights were conducted at maximum cruise settings in high blower.

RESULTS AND DISCUSSION:

17. A qualitative analysis of the R7V aircraft general arrangement and equipment installations revealed the following discrepancies.

a. Location of pilots headset jack boxes.

The present location of the headset jack box is such that a constant pull is put on the pilots head by the pig-tail type cord on the head set.

b. Location of Pilots Ash Trays.

The present location of the pilots ash trays in the center control stand is unsatisfactory.

c. Aileron Trim Tab Indicator.

Two Aileron trim tab indicators are provided. One indicator visible to the pilot consists of a pointer and a center mark only. The second indicator is graduated to indicate the direction and degree of aileron tab applied. This second indicator is not visible to the pilot or the co-pilot.

d. Location of Landing Gear and Wing Flap position Indicator.

The pilots view of the landing gear and wing flap position indicator is obstructed by the wing flap control lever and the electric elevator trim tab clutch lever.

e. Dual Flap Indicator and Assymetrical Flap Cut-Off Bus System.

The presently installed single needle flap position indicator and a single transmitter driven from the port inboard torque tube will not provide indications of flap assymetry, should one side or portions of one side of the flaps fail.

f. Co-Pilots Shoulder Straps.

When the co-pilots shoulder straps are not in use, they hang down and interfere with the flight engineer's auxiliary control quadrant, fuel cross-feed controls, and the engine analyzer controls.

g. Fuel Flow Indicators.

The fuel flow indicators on the test aircraft are marked in 500 lb increments up to 2000 lbs. Between each numbered graduation are ten index marks indicating 50 and 100 pound graduations. These 50 and 100 pound graduation marks are the same length and width making it extremely difficult to read the gauge accurately.

h. Windshield Anti-Icer.

The Hosa anti icing system is not adequate in heavy and severe icing. Ice can build up with impunity once a layer has formed and an outside source is necessary to clear windshield of ice.

i. Landing Gear Down Lock Latch Assembly.

The present landing gear down lock latch assembly has a tendency to cause binding of the down lock latch arm.

j. Cockpit and Flight Engineers Panel Lights Systems.

The lighting systems for both the pilots compartment and the flight engineers panel is considered inadequate.

k. Generator Switches.

The present location of the generator switches of the main junction box panel is such that movement of the co-pilots seat right hand arm-rest will inadvertently shut these switches off.

l. Pilots Turn and Bank Power Failure Indicator Light.

The location of this light is such that it is very difficult to see.

m. Fuel Supply for Cabin Heaters.

The flight hand book for the R7V-1 aircraft states that fuel for the cabin heaters is furnished from number two and three wing tanks. This statement has been found to be in error in some airplanes of this series.

n. Cross-Over Valve for Primary and Secondary Hydraulic Systems.

The R7V-1 aircraft has a primary and a secondary hydraulic system. In event of failure of the secondary system, power from the primary system cannot be used to lower the gear or flaps. (See para. 21 for further discussion.)

c. Cargo Hatches.

The present cargo hatches installed in the R7V-1 aircraft are hinged at the top and raised and lowered by means of a hydraulic piston. In the fully raised positions the hatches extend over the entry way. This design limits the cube of the cargo that can be loaded from a platform lift type of hoist.

p. Nose Wheel Steering Lights.

The presently installed 50 watt nose wheel steering lights are entirely inadequate.

q. Crew Bunks.

The present bunks installed in the R7V-1 are too narrow and uncomfortable.

r. Crews Head.

The crew head provided just aft of the navigators table is considered unnecessary.

s. After Heads.

The present installation of curtains around the after heads does not provide adequate privacy when mixed passengers are carried.

t. Internal Communications.

In the R7V-1 as delivered there is no provision for communication between the pilot and the flight orderly or between the pilot and passengers.

u. Standardized Aircraft Wiring System.

It has been found that the R7V-1 type aircraft do not have standardized wiring systems. It has further been determined that in some cases the actual wiring in the aircraft does not concur with the wiring diagram furnished with the particular aircraft.

v. Cabin Supercharger Duct Check Valves.

The present location of the cabin supercharger duct check valves, outboard of the primary heat exchangers, are such that any duct failure or high pressure leaks in the ducting or refrigeration components will cause failure of the entire pressurization system.

w. Rudder Pedal Adjustment Pawl.

Rudder Pedal adjustment has to be accomplished by hand.

x. Alcohol Anti-Icing System.

Three electrically driven anti-icing pumps are mounted in each out board engine nacelle. Only one pump in each nacelle delivers alcohol to both propellers on its side of the aircraft. In event of a propeller anti-icing pump failure on either side it is not possible to supply propeller alcohol to the failed side as there is no crossfeed between the left and right systems.

y. After Fuselage Reinforcement and Cradle Assembly Support.

There is no cradle support furnished to support the tail of the fuselage when heavy cargo is loaded aft in the cabin. In addition, the fuselage is not reinforced to withstand these loads during the use of such a support.

z. Rear Pressure Bulkhead Covering.

The fabric covering on the rear pressure bulkhead is not durable enough to withstand the constant removal of the pressure bulkhead necessary to gain access to the empennage sections. Continual patching is necessary to keep the fabric repaired.

aa. Fuel and Oil Filler Cap Chains.

Present installation of the fuel and oil filler cap chains is considered unsatisfactory. Instances of venting of fuel and oil overboard due to improper stowing of chains have occurred.

bb. Baggage Compartment Fire Warning and Carbon Dioxide System.

Presently no fire fighting or fire warning system exists in either baggage compartment. This is considered to be a very dangerous situation.

cc. Emergency Escape Chute.

At present no easy method exists to assist passengers from rear exit if the tail is high either in water or on ground.

dd. Confidential Mail Locker.

No locker is provided for stowage of confidential mail or matter requiring security.

ee. After Head Urinals.

There are no exterior drain facilities for ground servicing.

ff. Navigation Table.

The navigator presently is seated in the gangway between crew compartment and flight compartment causing such inconvenience to all concerned and interruption of the navigators work.

gg. Cargo Compartment Liners.

There is no method at present to identify aircraft equipment that is installed behind the baggage compartment liners without referring to detail drawings or blue prints furnished with the aircraft.

hh. Covers for Hatch Release Handles.
Clear plastic covers are presently used to cover handles on emergency escape hatches and cargo doors. These covers have proved to be quite fragile and easily misplaced.

ii. Rear Engine Nacelle Access Fairing.
These locations on underside of all engines aft collect oil to the extent that it is considered a fire hazard.

18. Enclosure (3) is a list of all RUDMs submitted on R7V-1 BuNo 128441 during the service trials. Those items of a recurring nature, or of such seriousness as to effect safety of flight, or which effect accessibility for maintenance purposes, are briefly commented on below. It is felt that immediate action should be taken to correct these discrepancies.

(a) RUDM Numbers 53-127, 153, 266, 316.

The cabin compressor high pressure discharge ducts are a constant source of trouble, due to frequent cracks and breaks occurring in the bellows section of the duct. This is a high usage item.

(b) RUDM Numbers 53-303, 293, 130, 220, 286, 282, 288.

Since receiving R7V-1 aircraft in March 1953, PRT failures have been continuous with a total of 42 failures in BuNo 128441 and 80 failures in other ships. These failures occurred on all aircraft during regular line flights and training flights. 90% of failures have been due to cracks in nozzle boxes, and on cooling shield around support welds. One PRT failure was due to an internal PRT gear train failure with subsequent loss of wheel buckets, and damage to nacelle cowl. Several failures were due to oil leakage past labyrinth seal.

(c) RUDM Number 137-53

The filler well drain for #5 fuel cell drains overboard on the under side of the starboard wing inboard of #3 nacelle. Should the filler cap gasket be damaged, fuel will be sucked overboard into the scupper and out the drain thence aft into a ram pressure air vent for the front section of the starboard heater package. A change has been incorporated to correct this discrepancy.

(d) RUDM Number 53-139, 177.

After the first 200 hours of R7V operation inspections revealed cracks in propeller spinner after bodies. The units were removed and a fix was received from Lockheed Aircraft Corporation through Bureau of Aeronautics to repair subject units locally. Repairs were made and units installed. Lockheed Aircraft Corporation also manufactured additional units with a new fix incorporated and shipped them to VR-1 for installation. Both the locally repaired units and the units manufactured by Lockheed Aircraft Corporation with the new fix were installed. After approximately 200 hours, propeller spinner after bodies were found to be cracking again in the same places as before.

With Bureau of Aeronautics approval, propeller after bodies were removed from all aircraft pending further disposition.

(e) RUDM Number 53-142.

High pressure oxygen leaks occur in the external oxygen filler valves located in a recess on the starboard side of the fuselage forward of the crew entrance door.

(f) RUDM Number 53-143.

Two flexible hoses are used for heat and ventilation for the pilot and co-pilot. This type hose will not withstand constant use and is located too close to the pilots feet. Excessive chafing of these hoses has occurred on all R7V aircraft.

(g) RUDM Number 53-168.

Location of the galley assembly in the after port section of the main cabin has made the deck water drain inaccessible. A hand hole cut in the bottom of the galley cabinet constituted a local fix.

(h) RUDM Number 53-179.

Two handles are installed on the emergency escape hatches. The upper handle is not required and hinders removal of the escape hatch in an emergency.

(i) RUDM Number 53-198, 199, 232, 262.

Aircraft was received from the manufacturer with the vacuum pump selector valves wired incorrectly which introduced pressurized air into the #1 & #4 engine vacuum pumps during all operations causing subsequent failure of 11 pumps.

(j) RUDM Number 53-252.

In complying with the initial 200 hour inspection of wing attaching bolts at port wing station 80, it was necessary to remove the auxiliary oil transfer tank. This required approximately 200 man hours. Relocation of this oil tank would improve accessibility of the wing attaching bolts and reduce this inspection time considerably.

(k) RUDM Number 53-156, 190, 194.

Acceptance check inspections on aircraft revealed numerous broken exhaust pipe clamps. Other exhaust clamps were observed to be two-blocked which led to the belief that these clamps were stretching after relatively few hours service, it is believed that this is a design problem rather than a material breakdown.

(l) RUDM Number 53-116, 284, 319.

The Hayes Expander type brake which is used on the R7V-1 is another recurring discrepancy which requires more than routine maintenance. Hydraulic leaks occur in the expander tube of the brake around the pal-nut, which secures the expander tube stem to the brake spider. The majority of failed brake assemblies can be repaired locally.

(m) RUDM Number 53-274, 276:

Reports have been received from returning flight crews that they are unable to utilize the Auxiliary Oil Transfer system in flight at high altitudes. Trouble has also been encountered with the tank float shut-off switch sticking, preventing oil transfer to certain engines.

19. A total of 14,872.3 man hours were required to perform the necessary maintenance of R7V-1 BuNo 128441 during the 860 hours of operation. Of this total, 11,620.0 man hours were routine maintenance, i.e. pre and post flight inspections, routine, major and intermediate inspections. The remainder of this time was non-routine maintenance i.e. correcting discrepancies by making adjustments, replacing failed parts or structural repair. The average man hours of maintenance per flight hour was 16.3. The following table shows a breakdown of the total maintenance time.

ROUTINE MAINTENANCE

Maintenance Type	Number Performed	Av No. Mon Req.	Man Hours Per Check	Total Man Hours	% of Total
Major Inspection	2	38	1000	2000	13.5
Intermediate Insp.	6	38	425	2550	17.1
Post Flt Insp.	15	38	135	2060	13.8
Pre Flt Insp.	75	10	60	4500	30.1
* Engine Changes (QEC)	3	4	170	510	3.4
<u>Sub Total</u>				<u>11,620</u>	<u>77.9</u>

NON-ROUTINE MAINTENANCE - DISCREPANCIES

COMPONENT	MAN HOURS	% TOTAL
Airframe	1113.7	7.5%
Electrical & Instruments	365.2	2.4%
Electronics	93.0	.6%
Power Plants	1453.8	10.1%
Pressurization System	120.1	.8%
APU (GPT 70)	106.5	.7%
<u>Sub Total</u>	<u>3,252.3</u>	<u>22.1%</u>
Total	14,872.3	100.0%

* Engine changes are considered routine inasmuch as their service life is 800 hours and the R7V-1 airframe service life is 1400 hours. 4 engine changes would be required during a normal service life of the R7V-1.

20. Items requiring excessive maintenance are discussed below.

(a) Engines and Accessories.

Excessive maintenance is required in maintaining the exhaust system of the R3350-34 engine. Power recovery turbines and cooling caps being the major items. The exhaust system is given a complete inspection during every post flight, intermediate and major inspection period. Nine power recovery turbines were changed due to the nozzle boxes cracking along the welds. Eleven cooling caps were changed due to warpage which renders the cooling cap unusable. Four cooling caps were changed due to cracks along the welds. In addition difficulty is encountered on high time turbine nozzle boxes becoming out of round requiring the cooling cap to be fitted to the power recovery turbine. The figure eight clamps supporting the exhaust stacks entering the power recovery turbines do not afford enough support for the exhaust stacks. Engine vibration causes these clamps to loosen permitting the exhaust stacks to drop, and become misaligned on the power recovery turbine ball joints, resulting in exhaust stack failure, and possible exhaust fires. Loose exhaust clamps required considerable maintenance. When re-torquing these clamps to the proper degree, the clamp would usually come together and "two-block" in which case the clamp would still remain loose resulting in many clamp changes. When installing the exhaust clamp, care must be taken to install the clamp properly as the clamp can only be fitted in one position. This position is determined by two notches in the outer circumference of the clamp bolt holes. These notches must be fore-aft in order to align the locating notch of the exhaust clamp with the detent of the exhaust stack. Misalignment of the clamp usually resulted in exhaust stack failure and created a fire hazard. Intake stacks required more than routine maintenance due to leaks occurring around the gland nuts. The intake packing shrinks after engine operation and causes the gland nut to become loose.

On two occasions, cylinders had to be changed due to the intake inserts backing out. One oil cooler failure was experienced during a test on #2 engine. In removing the failed cooler, extreme difficulty was encountered in removing the fire seal between the oil cooler regulator and "in" and "out" oil lines. This fire seal was secured by Phillips head screws, some of which were impossible to remove due to inaccessibility of the screw locations and by the maintenance personnel being unable to get enough leverage with a Phillips head screwdriver to remove the screws. Hex-head bolts should be used in place of Phillips head screws.

Excessive maintenance was required on the propeller governor stophead motor cannon plugs. On numerous occasions, electrical leads would loosen at the soldered connection on the cannon plug, resulting in an uncontrollable governor.

Three engine changes were required during the test period. One engine was changed due to damaged impeller blades, another was changed as a result of an impeller drive failure and the third was changed because of a broken exhaust valve passing through the power recovery turbine via the induction system. Particles of the broken valve damaged the leading edges of the power recovery turbine buckets.

Ignition distributors required excessive maintenance in that numerous instances of loose distributor cap clamps permitted the distributor cap aligning lug to chip into the timing segment of the distributor. In addition, many distributor failures were caused by the automatic spark advance mechanism remaining in the retarded position throughout the entire engine operating range.

(b) Airframes

Fuel leaks in the integral wing tanks sealant are numerous requiring excessive maintenance. In addition numerous skin cracks develop in the rear wing area aft of the engine nacelles due to "oil canning" and engine vibration. Reinforcement of these areas by the manufacturer during assembly will reduce the need for local repairs by the operator.

21. A major maintenance item which precipitated the termination of the test was the contamination of the entire hydraulic system due to the number three hydraulic pump failure. During run-up on Flight 90, the hydraulic pump low pressure warning light came on during idling and went out at 1300 RPM. The flight proceeded to Patuxent River, Maryland where the hydraulic pump was removed and hydraulic fluid in the pump was found to be contaminated with metal particles. The main and booster control system micronic filters were inspected and were found to contain an excessive amount of metal particles. An investigation of the entire hydraulic system was made to determine the extent of damage. Hydraulic fluid in the pressure and return side of all hydraulic components was found to be contaminated with both ferrus and non ferrus metal particles. Inspection of the seals and packing of various components revealed them to be impregnated with metal particles and in addition, the main and emergency reservoirs contained metal particles. The entire system was drained and flushed after installing new micronic filters in the main and booster systems. This procedure was accomplished three times with a diminishing amount of metal particles collected in the micronic filters each time. During this flushing period, the forward brake deboostor lockout on the starboard gear developed a hydraulic leak due to impregnated seals and scored cylinder walls. It is quite evident that the presently installed micronic filters bypassed contaminated hydraulic fluid to the booster control valves and actuating cylinders, possibly on the initial surge of hydraulic pressure to these units. It is believed that the 45 PSI differential by-pass pressure across the micronic filters is too low and should be increased. At present there is no protection afforded the primary and secondary hydraulic system in the event of a secondary system hydraulic pump failure. Both systems will be contaminated with metal particles should an internal failure occur on pumps #3 and #4.

22. The aircraft has been flown during various weather conditions including thunderstorms, gusty cross-wind landings and severe icing. The general performance and flight characteristics have been good. Control response under both normal conditions and with asymmetrical power is considered excellent. Flight characteristics in turbulent air are favorable. On several occasions severe static discharges and lightning strikes were experienced. Static discharges appeared to be more prevalent at air speeds from 185 to 210 knots indicated at temperatures of from -15°C to -20°C . A few instances of structural damage have been sustained in the form of burning out circuits in the radar (APS-42) antenna and arcing the points in the "HF" receiver antenna relays. Cross-wind landing characteristics are excellent; however at indicated air speeds below 115 knots aileron control becomes relatively sluggish in gusty conditions. Slightly higher approach speeds will adequately correct this situation. It is believed that the maximum cross-wind component rating certified by the Civil Aeronautics Authority might be substantially raised above the 30 knot figure listed in the flight operation instruction manual (Ref (k)).

23. Use of the Flight Operation Instruction Manual dated 1 August 1953 (Ref (k)) during the Service trials has revealed the following discrepancies:

a. Page 163 of reference (k) encourages the use of the electric elevator trim in making boost out landings. It is pilot opinion that no more nose up elevator trim be utilized for the landing than for the final approach. Therefore, pilots find little, if any, need for the electric elevator trim. Pilots often inadvertently energize the actuating switch in flight. For these reasons the electric elevator trim tab is considered unnecessary.

b. On page 163 of reference (k) it states, "In an emergency, the boost may be turned off at any airspeed but, if conditions permit, the speed should be maintained between 115 - 135 knots." This speed is considered too slow to commence boost out maneuvering. Without flaps, 115 knots is within 3 to 5 knots of the stall speed at 130,000 pounds gross weight. At an airspeed of 135 knots considerable control deflection is required to establish a positive change in attitude. It is therefore felt that this shifting should be done at speeds from 140 to 156 knots.

c. On page 175 of reference (k), the utilization of the G-2 compass for instrument take-offs is discussed. No mention is made that the compass selector switch should be placed in the "Free DG" position for the take-off. It has been observed that, with the selector in the "compass controlled" position, the compass may deviate by as much as 10° as power is applied and as the plane accelerates. An accurate heading may be maintained with the compass selected to "Free DG".

d. Reference (k) has deleted the prescribed airspeeds and configurations for range, GCA, and ILS approaches and slow cruise holding. It has been determined locally that the following speeds and configurations are most desirable:

(1) Within holding patterns it is desirable to reduce airspeed in order to remain within reasonable distances of fixes and for the conservation of fuel. Slow cruise without flaps may be accomplished at speeds as low as 150 knots but the control response is relatively sluggish. With the utilization of 60% flaps, slow cruise may be conducted at 140 knots with positive control response and slightly less power than required for slow cruise without flaps. It is recommended that this configuration be used for holding patterns.

(2) When a range approach is commenced with no further delay expected, the RPM is advanced to 2400 to provide a flexibility of power by throttle adjustment without the possibility of over-boosting. An airspeed of 140 knots is employed with 60% flaps for descent rates of 500 to 600 feet per minute. Should a descent rate of 1000 feet per minute be desired, 80% flaps is utilized and an airspeed of 140 knots. This increases the drag and eliminates the necessity of reducing the throttle to extremely low BMEP's. These configurations will require a minimum of 20 inches manifold pressure throughout the approach. The gear is lowered until breaking contact with the field unless a straight-in approach is being made in which case the gear may be lowered at the low cone. Flaps are utilized throughout the approach instead of the gear inasmuch as they may be retracted faster and do not produce vibrations and buffeting.

(3) The same airspeeds and configurations are utilized in the GCA pattern as for the range approach until the plane is approaching the glide path. The final approach to the glide path is made in level flight at 140 knots and with 60% flaps. When the glide path warning is given by the GCA director, the gear should be lowered and the airspeed reduced to an approach speed of 130 knots. The glide path will be maintained in this configuration until contact with the field is established, at which time additional flaps may be utilized as for a normal landing.

(4) Configurations and airspeeds are utilized for the IIS approach in the same manner as for the GCA approach.

24. The cruise control data used to set up speed power charts for the service test aircraft was preliminary navy data obtained by this squadron from the Lockheed Aircraft Corporation. This data was broken down and set up in a series of simplified charts in order to facilitate pre-flight computations and enroute power settings. The following information was made available on the charts: horse power, rpm, bnop, fuel flow, indicated airspeed and true airspeed for gross weights in 5000 pound increments and at all density altitudes applicable. The main discrepancy in the presentation of the basic cruise data was the termination of all low blower operation at 15,000 altitude and beginning the high blower operation from 15,000 altitude and above. By projecting curves on the preliminary data it was possible in some cases to obtain critical low blower operation above the 15,000 low blower altitude for power charts. However, in most cases it was necessary to revise this data by flight test in order to obtain the correct information for planning and in-flight usage. In many cases it was found low blower operation went as high as 19,000 feet. Maximum cruise power was used for 2/3 of all flights on the service test aircraft and has been used extensively for normal operation in other squadron aircraft. The predicted speeds were relatively close to actual. Indicated fuel flows were slightly higher than predicted. The critical altitudes

using 10% manual lean were not as high as originally anticipated. The use of maximum cruise power results in high fuel consumption and high gross weights due to fuel necessary and cuts into available cabin loads. It is possible that constant high power operation may shorten engine life, but a comparative test has not been completed to definitely confirm this supposition. Using maximum cruise power through a wide range of gross weights has brought out the fact that the airspeed increases normally as the gross weight decreases to approximately 115,000 pounds. At this point the increase in airspeed relative to the decrease in weight is lessened. This may indicate the desirability of operating at less than maximum power at the lesser gross weights. The long range cruise data has given good results both on the service test flights and on routine operations providing the flights were over eight hours duration, and head winds were not over 30 knots. Here it has been noted that on any type of cruise control available for this airplane, at high gross weights and at an altitude requiring high blower operation, or near low blower critical altitude, the power required is at or near maximum cruise power. This fact thereby eliminates actually obtaining any benefits from a long range flight with high cabin loads resulting in high gross weights, for any flight less than the eight hour limit. In order to eliminate operating the engines at maximum cruise power on flights up to 2,000 miles and also to have lower fuel consumption but to maintain a relatively fast cruise speed it was apparent there was a definite necessity for some type of cruise control somewhere between maximum cruise and long range cruise. Further investigation with Lockheed Aircraft Corporation revealed a preliminary copy of an intermediate type cruise control that had been submitted to the Navy for approval. Several test runs were made on squadron aircraft and the charts smoothed out to give more accurate powers and airspeeds with the desired results (Enclosure 6). In addition to obtaining a lower fuel consumption, a relatively fast cruise speed, a reduction in cabin noise; a power setting that is easy for the flight engineer to maintain has been realized. The power setting, generally speaking, is one of constant rpm and horsepower at 2200 rpm and 1600 bhp. Three engine cruise power charts were made up from preliminary data. This information is in use although specific three engine data as a result of flight tests is not available, however, three engine operation of other aircraft indicates that these three engine cruise charts are quite adequate. Data on two engine performance is desirable for use when necessary to three engine ferry the aircraft and to facilitate engine maintenance at home base. Other cruise data which may be of value includes a determination of wind component values for the purposes of utilizing the most effective type cruise power for the intended flight operation when headwinds from 30 to 50 knots exist.

25. In order to effect a compromise between convenience, desirable center of gravity, and minimum cargo handling at enroute or intermediate stops, it is deemed most practical to load the R7V-1 type aircraft by placing the high density cargo in the starboard side of the cabin and low density loads (passengers) on the port side. This load configuration makes possible passenger access to the two emergency windows on the port side instead only one on the starboard; in addition, access to lower baggage compartments and emergency flap mechanism hatches, and the AeroTrusty cargo handling track located on the starboard side of the cabin is available. In order to accomplish this configuration, 15 double sets of webber seats are installed on the port side and 6 triple sets of seats are installed behind the cargo in the starboard side of

the cabin. However, due to the installing and removing of these seats to expedite cargo loading and unloading at enroute stations, service life of these seats is greatly reduced due to the limited durability of the leatherette covers. Additional problems encountered in ground handling are:

a. The down ward slope of the cabin deck is disadvantageous when transferring cargo from or to leveled fork-lifts or plat-form trucks. This handling difficulty contributes greatly to loading and unloading delays and jeopardized equipment and personnel.

b. The change in the deck angle aft of the trailing edge of the wing causes friction and interference when operating the conveyor chain. Rollers or some other compensating device should be installed at this point.

c. Cargo tie-down fittings in the cabin will not permit more than one line or strap to be used at a time. In order to take advantage of the possible 4000 pound stress, these fittings should be made large enough to accommodate more than one hook or line.

d. Lower baggage compartments contain tie-down fittings in the deck only, provision should be made to install fittings in the overheads. This will make the lashing down of cargo or baggage more feasible.

26. During a routine flight to the West Coast, an extensive carbon monoxide survey was conducted. A colorimetric bulb type indicator Mark II was used. Readings were taken in the cabin and cockpit during ground turn-up, taxi, takeoff, climb and cruise. Although this type of indicator is not noted for its accuracy, repeated attempts to observe a reading gave no results. This indicates that under no conditions are carbon monoxide contaminations to be found in excess of .2%. This value is well within specifications and is very satisfactory. Although cabin heating appears to be entirely adequate, the complete absence of a thermometer in the passenger compartment makes it difficult to maintain a comfortable temperature level in the cabin. Other items concerning crew and passenger comfort are noise level and vibration. Although no noise intensity tests were made, it is considered that noise and vibration levels in the vicinity of the main wing spar are excessive. This area is generally occupied by the relief crew and because of the fatiguing effects of noise and vibration, this condition is considered to be unsatisfactory. Efforts to reduce these effects by insulation and a deck covering should be made.

27. The inspection forms, enclosure (5), were made up by this squadron based on the Handbook Inspection Requirements Navy Model R7V-1 aircraft, reference (h). These are utilized and filled in by maintenance personnel in the completion of the various checks on the aircraft. These checks are constituted as follows:

a. Preflight Inspection. This inspection is accomplished prior to flight when the aircraft has not flown during the preceding 24 hours, or more frequently when warranted.

b. Post Flight Inspection. This inspection is accomplished at the expiration of 30 flying hours or 10 calendar days, whichever occurs first, or more frequently when warranted. The amount of flying hours may be extended to 50 hours provided the aircraft is not on the ground at any one time for more than 24 hours during this extended period (30-50) hours. Postflight inspections required only by reason of the aircraft having been on the ground for more than 24 hours may, however, be waived in the case of aircraft on protracted flights.

c. Intermediate Inspection.

(1) The FIRST intermediate inspection is accomplished at the expiration of 100 flying hours after the preceding major inspection, or more frequently when warranted. A 20 hour extension is authorized when required to meet operational commitments.

(2) The SECOND intermediate inspection is accomplished at the expiration of 100 flying hours after the first intermediate inspection (normally 200 hours after the preceding major inspection), or more frequently when warranted. A 20 hour extension is authorized when required to meet operational commitments.

(3) Further, a calendar intermediate inspection is accomplished regardless of flying hours, when an aircraft does not accumulate the flying hours specified during a 60-day period since the last intermediate or major inspection. Exceptions to the above are (1) aircraft undergoing prolonged repair, (2) those in extended storage. The Special Inspection Requirements will be accomplished, as applicable.

d. Major Inspection. This inspection is accomplished at the expiration of 100 flying hours after the second intermediate inspection (normally 300 hours after the preceding major inspection), or more frequently when warranted. A 20 hour extension is authorized when required to meet operational commitments. Further, a calendar major inspection will be accomplished, regardless of flying hours, when an aircraft does not accumulate the flying hours specified during a 180 day period since the last major inspection. Exceptions to the above are, (1) aircraft undergoing prolonged repair, (2) those in extended storage. The Special Inspection Requirements will be accomplished, as applicable.

28. In respect to the auto-pilot (PB-10), there were a total of seven discrepancies recorded during the service test. Of these discrepancies, three were related to the oscillations experienced when the altitude control was engaged. The same altitude control trouble was experienced in all other R7V-1 aircraft assigned. This condition was never completely remedied in R7V-1 BuNo 128441 and is believed to be caused by a combination of the following:

a. Improper control cable tension.

b. Improper settings of the sensitivity control potentiometers in the equipment itself.

c. Variations in the frequency of the aircraft inverters, from the normal 400 cycles output.

The Lockheed and Eclipse Pioneer Companies have joined in a concentrated effort to remedy this situation. With the exception of the altitude control, it is considered that the PB-10 operated satisfactorily.

29. The G.T.P. 70-3-1 auxiliary gas turbine power unit is installed to furnish d.c. power when needed for starting engines and anytime d.c. power is needed. Troubles encountered were as follows:

a. The starter motor is a $1\frac{1}{2}$ hp, 24 volt, direct drive motor. The motor should be operated with a minimum voltage of 18 volts. It has been found that the G.T.P. 70, is too far from the d.c. power supply causing the starters to operate under a lower battery voltage resulting in extended starts putting an undue strain on the starter. Thus the life of the starter motor is greatly reduced. The starter motors located in an unpressurized area of the fuselage, are also being overloaded by the extreme cold conditions existing when flying at high altitude causing the oil in the units operation parts to congeal. This condition makes it difficult to start the unit after landing.

b. The fuel pump is a positive displacement pump. These pumps have a silver lined pump body which is very easily scored due to the presence of foreign matter.

c. The hourmeters are a timing device used to determine the operating time of the G.T.P. -70. The wires in this electrically operated unit are very small and it has been found that they break very easily due to vibration.

d. Tachometer Generator Garlox Seals. Serious oil leaks have occurred in this seal due to the change over to a winter grade oil, of a lower viscosity.

e. Due to the manner of installation of intakes of the G.T.P. 70 the turbine ~~and is~~ exposed to any driving rain or snow, in flight or on ground. This rain or snow freezes in the turbine wheel causing the G.T.P. to become inoperative. This creates an overload condition on the starter and electric system of the APU circuit.

30. The fuel measuring indicators being a vital element in the test procedure required modification so that reliable data could be obtained. Preliminary comparison of actual fuel consumption with the fuel measuring equipment (corrected fuel flowmeters) indicated considerable variation. On 30 July 1953, four Revere type fuel quantity totalizers, calibrated in gallons, were installed on the test article. In order to obtain actual temperature of the fuel consumed and enable the accurate determination of the fuel flow in pounds from the Revere totalizer, four temperature measuring units were installed in the fuel system at the fuel inlet on the master control. Steady state fuel flows were recorded on subsequent flights in order to compare actual engine consumption with that recorded by the fuel measuring indicators (ie, corrected Pioneer fuel flow meters, capacitance gages and the Revere totalizers). A summary of the data recorded from these flights indicated an average deviation of approximately 5% to 7%, between the actual engine

consumption and the fuel measuring indicators. This test did not preclude the possibility of the Revere totalizer being in error. A program was conducted to evaluate the accuracy of Revere totalizers against a weighed quantity of fuel, corrected Pioneer fuel flowmeters and the actual engine consumption. Fuel tanks and engine numbers two and three respectively, were used for this test. Data recorded on tank three indicated 511.3 lbs of weighed fuel was consumed against 514.0 pounds consumed shown by the Revere fuel counters or a difference of .53%. Tank two indicated 412.0 pounds of weighed fuel was consumed compared to 428.0 lbs indicated by the Revere fuel counters or a difference of 3.89%. This was an average difference in indicated and actual fuel consumption of 2.21% for both engines. Forty-five (45) steady state cruise power fuel consumption values were obtained during routine operation flights, between Patuxent River, Maryland and Moffett Field, California as follows:

- 18 at low blower various cruise powers.
- 12 at high blower various cruise powers.
- 15 at high blower maximum cruise power.

Summaries of these fuel consumption checks showed that:

a. The pioneer fuel flowmeters indicate higher fuel consumption than the Revere totalizers by approximately 5%.

b. The Revere counters indicate approximately 2% higher fuel consumption than the actual engine consumption.

c. Present calibrated Pioneer fuel flow instruments as installed do not indicate accurate fuel flow as compared to the actual engine consumption. This inaccuracy may be due to instrument and/or installation errors.

31. Records were kept during the course of the test to determine the oil consumption characteristics of the power plants. The mean oil consumption appears to be about .8 gallons per engine per hour of operation. Oil consumption did not appreciably increase with engine time. It should be noted that this remark does not pertain to overhauled engines for which no data could be compiled. It was noticed, however, that oil tank quantity level at take-off did materially affect oil consumption. If the oil level at take-off was carried at 40 gallons, the oil consumption would be 1.4 gallons per hour, at 35 gallons - .8 gallons per hour, and at 30 gallons - approximately .5 gallons per hour. It appears that the optimum oil level per tank would be about 35 gallons. This policy is being presently adhered to in squadron aircraft.

CONCLUSIONS

32. From the results of the service trials conducted on the R7V-1 aircraft Bureau Number 128441, it is concluded that:

- a. The R7V-1 aircraft is unsatisfactory but acceptable for service use.
- b. The R3350-34 engine as installed in the R7V-1 aircraft requires excessive maintenance.
- c. That the discrepancies noted in this report are excessive, undesirable, and in some instances render the aircraft marginal from a safety standpoint.

RECOMMENDATIONS

33. A review of the discrepancies uncovered during a qualitative analysis of the R7V-1 general arrangement and equipment installations (para 17) leads to the following recommendations:

(a) That the pilots headset jack boxes be relocated to a position above the pilots heads.

(b) That the pilots ash trays be relocated under the forward edge of the sliding cockpit windows.

(c) That the aileron trim tab indicator be redesigned to show degree of movement.

(d) That a system of three green lights to indicate gear down and locked and one red light to indicate gear unsafe be installed.

(e) That all R7V-1 aircraft be equipped with a fuel flap indicator, each needle to be driven by a separate transmitter located on the out-board section of the flap torque tube drives. In addition it is recommended that a cut-off bus system be installed to insure that the downward travel of the flaps will be immediately halted should the flaps become asymmetrical beyond five percent of travel.

(f) That a fabric bag or similar container attached to the back of the co-pilots seat to hold the shoulder straps when not in use be furnished.

(g) That fuel flow gages more easily readable be provided.

(h) That a windshield alcohol deicing system be provided in the R7V.

(i) That the landing gear down lock latch assembly be modified to prevent binding.

(j) That the Grimes type individual lighting shields be utilized throughout the cockpit and flight engineers panel.

(k) That suitable switch covers or guards be provided for the generator switches to prevent them from being inadvertently turned off by movement of the co-pilots seat.

(l) That the pilots turn and bank power failure indicator light be relocated.

(m) That the cabin heater control panel be placarded to indicate which tanks furnish fuel to the cabin heaters.

(n) That the hydraulic system cross-over check valve be replaced with a three way selector valve (off, primary, secondary) so that two distinct hydraulic systems would result, either system capable of standing by for, or replacing, the other system.

(c) That the cargo hatches be redesigned so that they swing out of the way to allow a crane type cargo lift to be used.

(p) That the presently installed 50 watt nose wheel steering lights be replaced with 150 watt lights with diffused lateral beams.

(q) That more comfortable adequately curtained crew bunk be provided.

(r) That the crews head located aft of the navigators table not be installed.

(s) That suitable swinging or folding, solid doors be provided for the aft heads.

(t) That a signal light in the tail compartment operated from the cockpit to be used to signal the orderly to man the interphone station in the aft cabin be installed; lighted "No Smoking" and "Fasten Seat Belts" signs controlled from the cockpit be installed and that a public address system with transmitting microphones in the cockpit and at the flight orderlies station be installed.

(u) That the manufacturer provide more accurate and adequate wiring diagrams with each aircraft delivered.

(v) That the cabin super charger duct check valves be relocated inboard of the refrigeration units to preclude the possibility of failure of the entire pressurization system and to simplify maintenance trouble shooting by allowing one side of the pressurization system to be isolated.

(w) That a means of adjusting the position of the rudder pedals by toe pressure be provided.

(x) That a cross feed be provided in the alcohol anti-icing system.

(y) That a cradle support, be furnished to support the tail of the fuselage when heavy cargo is loaded into the cabin aft and that the fuselage be reinforced to withstand concentrated loads during the use of this support.

(z) That an aluminum or other durable covering be provided in lieu of the present fabric covering on the rear pressurized bulkhead.

(aa) That the chains on the fuel and oil filler caps be reinstalled to prevent "venting" of the tanks due to improper stowing of the chains.

(bb) That a fire warning and carbon dioxide dispensing system be installed in the baggage compartment.

(cc) That a canvas type emergency escape chute be provided for attachment to the after cabin passenger door.

(dd) That a suitable locker be provided in all military transport type aircraft for stowage of classified matter.

(ee) That provision be made for draining the after head urinals without removing them from the aircraft.

(ff) That the navigators station be rearranged to relieve congestion in the passageway behind the navigator either by making an indentation in the navigation table for the navigators body or by turning the entire table 90° degrees with the navigator facing forward.

(gg) That the baggage compartment liners be labeled so that equipment, valves and accessories behind them can readily be located.

(hh) That more durable hatch handle covers be provided.

(ii) That suitable gaskets be provided between the access plates and fairings on the engine nacelles to prevent the accumulation of engine oil.

34. It is also recommended that:

(a) Continuing research and study be made to provide more durable cabin compressor high pressure discharge ducting.

(b) A program of research be pursued to reduce the high incidence of power recovery turbine nozzle box and cooling shield failures. These failures are not peculiar to the R7V but are common to all aircraft utilizing engines with blow down turbines.

(c) The manufacturer investigate the auxiliary oil transfer system and the possibility of removal of the automatic units of this system rendering it entirely manual. This would preclude not being able to transfer oil due to the automatic tank float shut-off switch sticking.

(d) That the engine manufacturer investigate the high incidence failure of exhaust system clamps in effort to provide more reliable clamps for the purpose of reducing extensive maintenances and in-flight fire hazards.

(e) Manual spark advance mechanism be incorporated in lieu of the automatic spark advance system

(f) The following changes be incorporated in the hydraulic system:

(1) Suitable filters be installed in the pressure side of the system.

(2) Installation of a differential pressure gage for indicating pressure drop across the main micronic filters.

(3) Relief pressure be increased on all filter by-passes.

(4) Means of isolating the main landing gear when extending the nose gear manually.

(g) Prior to delivery of aircraft to operating squadron, sufficient flight testing be conducted so as to enable the completion of reliable, simple and clearly presented cruise control charts.

- (h) The Weber seats be covered with a more durable fabric.
- (i) Install cargo tie down facilities on overhead of baggage compartment.
- (j) Rollers or other compensating devices be installed in the conveyor track at the point where the deck angle changes to reduce friction.
- (k) Larger tie down fittings be installed in the cabin to allow use of more than one tie down strap, hook or line in order to realize the advantages of the permissible 4000 pound stress.
- (l) Continued study be made to reduce the noise and vibration levels in the cabin in the vicinity of the propeller plane.
- (m) Efforts be made to furnish a more reliable automatic altitude control for the PB-10 autopilot.
- (n) The following changes be incorporated in the G.T.P.-70 (Ground Turbine Power Unit):
 - (1) Some method be devised for boosting the power supply for starting.
 - (2) An oil heater be installed.
 - (3) Heavy duty fuel pumps be installed.
 - (4) Heavier gage wiring be installed on the hourmeter.
 - (5) The turbine wheel be furnished adequate protection from collecting rain, snow, or ice.
 - (6) Suitable seals be provided to prevent oil leaks.
- (o) A review of available, suitable and accurate fuel flow meters be made with a view to installation of such a meter in the aircraft.
- (p) A study by the aircraft and engine manufacturers be conducted to correlate the power plant scavenging system with the oil tank hoppers to preclude excessive breathing whenever the oil tank quantity level is above 35 gallons.

35. It should be noted that action has already been initiated by the Chief of the Bureau of Aeronautics and by the Lockheed Aircraft Corporation to correct a number of the deficiencies reported herein.


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ENCLOSURE (1)

REPLACEMENT PARTS USAGE DATA

The information contained herein is reflected on the "Parts Usage" as experienced on the Service Test aircraft. It is listed in order of part number and classification such as, engine, airframes, and accessories. The first column reflects part number, second reflects number of times that particular item was replaced. Third column shows "Part Title" followed by Reason for Change. The last indicates the JUDI number concerning the particular part, if any.

By reference to the listing High Usage Items can easily be noted.

ENCLOSURE (1)

PARTS USAGE DATA BUONO 128441

<u>P/N</u>	<u>NO.</u>	<u>TITLE</u>	<u>REASON FOR CHANGE</u>	<u>JUDI REF.</u>
<u>ELECTRICAL</u>				
R17-V-880	1	A/C Voltmeter	Unreliable	
R17L11491-500	1	LIGHT-Landing	Burned Out	
R17-F-13045	1	Flashing Light Unit	Shorted Out	
<u>AIRFRAMES</u>				
R82LH-324991-600	4	Hood Assy-Eng. Turb. Ex.	Cracked	53-121
"	4	#1 "	Replaced for modified Hood Assembly	None
R82-LH-319270-4	10	Prop Spinner Afterbody	Cracked Supports	53-139,177
R82LH-324296	2	Hood Assy-Eng. Turb. Ex.	Damaged	
R82GD-G2-597	10	Brake Assy. Main L.G.	Hydraulic Leak	53-319,207 70,273 116,284.
R82-LH-302102	3	Passenger door upper carriage bracket assy.	Broken Assy.	53-107,110 149.

ENCLOSURE (1)

REPLACEMENT PARTS USAGE DATA BUNO 8441

P/N	NO.	TITLE	REASON FOR CHANGE	RUJDM REF.
<u>AIRFRAMES (Cont'd)</u>				
R82-LH-57910	1	Supercharger-Cabin primary	Reactor Pump Housing Cracked	53-182
R82-LH-314097-4	5	Duct Assy-Pressure	Cracked Assembly	53-153,266
R82-LH-312305-4	1	Cabin Outer Window	Scratched Pane	None
R82-LH-312305	1	Cabin Outer Window	Chipped Pane	None
R82-LH-321810	3	Bracket Assy-Eng Blower Control	Elongated Bolt Holes	53-145
R82AIR-31552	4	Actuator Assy-oil cooler flap	BULLER Dispatch 11.361 DTG212247Z	None
"	2	Actuator Assy-oil cooler flap	Assembly Failure	
R82-AA-44710M1	2	Actuator Assy-Cowl flap	Worm gear fouled	
R82-BCC-AYLC2252-1	2	Actuator-Two Position (Supercharger Dump)	Shorted Out	53-275
R82GD-L10793-6	2	Heater Blanket Aux Oil Transfer Line	Element Broken	53-274,276
R83LEM-2254	3	Cylinder Assembly Brake Lockout	Internal Hydraulic Leak	
R83EQ-10902-4	2	Blade Assy-Windshield	Wiper Blades Damaged	None
R83-AIR-87310-125	1	Cooler Assy-Oil	Oil Leak #2 Engine	
R83-APC-01200	2	Valve-Oil Check	Oil Seal Leaking	53-144
R83LE-E1725	3	Inverter 3 Phase	Would not hold frequency under load	
R84WAC-R3350-34	1	R3350-34 Engine #1	Damaged Impeller	Chngd at LAC, Burbank Calif.
"	1	" "	Internal Failure	Chngd at NAS, Moffett Field, Calif.
"	1	" "	#3 Cyl. Exhaust Valve failure and Impeller Damaged	53-195

PLACEMENT PARTS USAGE DATA BUN 28441

P/N	NO.	TITLE	REASON FOR CHANGE	RUDEI REF.
<u>ENGINES</u>				
R85AC-391459	1	Power Recovery Turbine Complete	Warped Turbine	
"	9	Power Recovery Turbine Complete	Cracked Turbine	53-285
"	3	Power Recovery Turbine Complete	Damaged Ball Joints	
"	1	Power Recovery Turbine Complete	Oil Seal Leaking	
"	9	Power Recovery Turbine Complete	Removed for Straddle Saddle PRT Replacement	None
"	4	Power Recovery Turbine Complete (Straddle Saddle)	Cracked Turbine	53-303
R85AC-429869	4	Shield Assy-PRT Turbine Wheel Hub Cooling	Cracked Turbine	53-50,125, 220,224, 225,289, 288.
"	11	Shield Assy-PRT Turbine Wheel Hub Cooling	Warped Assembly	53-293
R85AC-428532	6	Pipe Assy-Complete Rear Exhaust	Cracked Assembly	
R85AC-428533	2	Pipe Assy-Complete Rear Exhaust	Worn Ball Joint	
R85AC-428531	2	Pipe Assy-Complete Rear Exhaust	Cracked Assembly	
R85AC-428597	22	Clamp Assy-Exhaust	Cracked and Worn Assembly	53-156,190, 194.
R85AC-427904	3	Bracket Assy-Exhaust	Cracked Assembly	
R85AC-136949	1	Rod-Fuel Injection Pump Synchronizing	Bent Rod	53-213
R85AC-13672372	1	Control Assy-Fuel Injection Master	High fuel flow	
R85AC-13672372	1	Model PR-5852	Fuel Strainer flow Damaged	None
R85AC-881324	1	#17 Cyl #2 Engine	Intake insert Loose	

REPLACEMENT PARTS USAGE DATA BU 128441

P/N	NO.	TITLE	REASON FOR CHANGE	INDEX REF.
<u>ENGINES (Cont'd)</u>				
R85W.C-881324	1	#1 Cyl #3 Engine	Damaged Cylinder	53-165
"	1	#1 Cyl #4 Engine	Intake Insert Out	53-148
R85W.C-425751	1	Housing Assy-Pushrod	Hole Chaffed thru	None
R85W.C-428192	2	Pipe-Intake Rear Dual Cyls.	Damaged Pipe	None
R85W.C-891147	1	Nose Section Sump Pump and Sump Assy.	Cracked Sump	53-206
<u>ACCESSORIES</u>				
R86ST-135154-4	1	Pump Fuel Injection R. H.	#10 Cylinder Plunger Failed	53-140
"	1	Pump Fuel Injection R. H.	Replaced in Trouble Shooting Procedure	None
"	1	Pump Fuel Injection R. H.	Replaced in Trouble Shooting Procedure	None
R86ST-135156-1	10	Nozzle-Fuel Injection	Bad Spray Pattern	
R86V1-A-20510	2	Pump Assy-Hydraulic	External Leak	
"	1	" " "	Internal Failure	To Be Submitted.
R86PE-3P485	11	" " Vacuum	Sheared Shafts	53-198, 199, 217, 230, 232, 262.
R86SNT-10-32515-6	3	Distribution Assy Ignition	Advance Spark Inoperative	To Be Submitted.
R86SNT-10-32515-6	6	Distributor Assy Ignition	Timing Segment Chipped	53-218
R86SNT-10-32830-1	1	Magneto Model DLM-9	Shorted Out	
R86SNT-10-58455-1	9	Coil Assy-Ignition	Changed in trouble shooting procedure	None
R86AP-18470-4	1	Pump -Heater Fuel	Motor Burned Out	
R86AIR-48110-1	1	Startermotor (GPT-70)	Shorted Out	53-191
<u>PROPELLERS</u>				
R87-P115	2	Propeller	Spider Block Cracked	53-267

REPLACEMENT PARTS USAGE DATA BU 128441

P/N	NO.	TITLE	REASON FOR CHANGE	QUANTITY
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PROPELLERS (Cont'd)

R87HS-5U18-1-11915	1	Governor Prop	Prop will not calibrate	
R87HS-5U18-1-11915	1	" "	Oil in Motor	
R87HS-322080P3	1	Synchronizer Assy-Prop	3% Limiter Inoperative	

INSTRUMENTS

R88PE-662424	2	Generator Tachometer	NMI Fluctuation	
R88T2055-025-000	3	Transmitter-Fuel Press	Fuel Pressure Fluctuation	
R88T1965-000-000	9	Transmitter-Fuel Flow-motor	Replaced for Calibrated transmitters	None
R88T1200-012-000	3	Indicator-Fuel Flow-motor	Replaced for Calibrated Instrument	None
R88E1000-000-000	10	Bulb-Temperature Cyl. Head	Shorted Out	
R88U2001-000-000	1	Warning Unit Oil Pressure	Open Circuit	
R88T2657-060-000	1	Transmitter-Alcohol Quantity	Open Ground load in Transmitter.	
R88I1330-010-000	1	Indicator-Gyro Horizon	Unreliable	
R88T1910-050-000	1	Transmitter-Compass Gyro Fluxgate	Shorted Out	53-120
R88I12003-205-000	1	Indicator Tank #124 Fuel Quantity	Case cracked	None
R88I1920-005-000	1	Indicator-Pressure Supercharger Air	Improperly calibrated	
R88A0540-000-000	3	Amplifier PB10 Auto Pilot	Unstable Performance	
R88I1884-736-000	1	Indicator Dual Magnesyn Cowl Flap	Inoperative	

ENGINES (Cont'd)

R85WAC-429753	1	Heater-Torquemotor Line	Element Broken	53-163
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REPLACEMENT PARTS USAGE DATA BUNO 8441

P/N	NO.	TITLE	REASON FOR CHANGE	QUANTITY
<u>NON-STOCK NUMBERS</u>				
* AN 6024-6	1	Valve Assy-Oxygen Check	External Leak	53-150
* Cal Flex 299818-4	1	Hose Pilots Heat and Vent Outlet	Damaged Hose	53-143
*	1	GPT-70 Exhaust Over- Temperature Switch	C Sticking Switch	53-214
* RB2 -7-1450-2		Valve Assy-Micro- motor Air Needle	Element Broken	53-157

* Part number unknown, best available number shown.

ENCLOSURE (1)

ENCLOSURE (3)

LIST OF REPORTS OF UNSATISFACTORY OR DEFECTIVE MATERIALS

NO.	VR-1 RUMM REFERENCE	SUBJECT	DATE
1	53-115	TERMINAL, CARGO HATCH	3 June 53
2	53-116	EXPANDER TUBE ASSEMBLY	11 June 53
3	53-117	WING STRUCTURE	15 June 53
4	53-118	THROTTLE ASSEMBLY	12 June 53
5	53-119	CARTRIDGE-PASSENGER DOOR	16 June 53
6	53-120	GYRO FLUX TRANSMITTER	15 June 53
7	53-121	FLIGHT HOOD, POWER RECOVERY TURB.	15 June 53
8	53-127	ELBOW, CONE CHECK VALVE	25 June 53
9	53-130	POWER RECOVERY TURBINE	26 June 53
10	53-137	TUBE ASSY., FILLER WELL DRAIN	16 July 53
11	53-139	PROP SPINNER PAIRING	7 July 53
12	53-140	FUEL INJECTION PUMP	8 July 53
13	53-141	FUEL DUMP VALVE	7 July 53
14	53-142	VALVE, HIGH PRESSURE OXYGEN	8 July 53
15	53-143	HOSE, PILOTS HEAT AND VENT	8 July 53
16	53-144	VALVE, FLAP ER CHECK	7 July 53
17	53-145	SUPPORT ASSY., SUPERCHARGER OIL CONTROL VALVE	7 July 53
18	53-148	CONNECTOR, INTAKE PIPE	17 July 53
19	53-149	CARTRIDGE, PASSENGER DOOR	15 July 53
20	53-152	LOCKHEED ELECTRICAL BUSINESS	15 July 53
21	53-153	DUCT ASSY., SUPERCHARGER DISCHARGER	16 July 53
22	53-156	CLAMP AND JOINT ASSY. EXHAUST PIPE	20 July 53
23	53-157	MICROMETER AIR NEEDLE	21 July 53
24	53-161	ASSEMBLY, TAXI LIGHT	22 July 53

ENCLOSURE (3)

LIST OF REPORTS OF UNSATISFACTORY OR DEFECTIVE MATERIAL

NO.	W-1 REFERENCE	SUBJECT	DATE
25	53-162	BRACKET ASSEMBLY	27 July 53
26	53-163	HEATER, TORQUE METER LINE	29 July 53
27	53-164	GEAR BOX ASSEMBLY, EMERGENCY OPERATION FLAPS	28 July 53
28	53-165	FIRE DETECTION SYSTEM	30 July 53
29	53-166	WIRE, PROP REVERSING	23 July 53
30	53-167	WIRE, PB-10 ALTITUDE CONTROL	31 July 53
31	53-168	GALLEY ASSEMBLY, LEFT FLOOR STORAGE	31 July 53
32	53-177	PROP SPINNER PLATING	14 Aug. 53
33	53-178	COUPLING FLANGED	21 Aug. 53
34	53-179	HANDLE, EMERGENCY ESCAPE	28 Aug. 53
35	53-180	SEAL, CABIN RELIEF VALVE INLET	27 Aug. 53
36	53-182	SUPERCHARGER, CABIN PRESSURE	26 Aug. 53
37	53-186	SCUPPER ASSEMBLY, OUTBOARD OIL TANK FILLER	31 Aug. 53
38	53-190	EXHAUST CLAMP ASSEMBLY	9 Sept 53
39	53-191	STARTER MOTOR, AIRSEARCH	1 Sept 53
40	53-193	OVER CONTROL, VOLTAGE PANEL	4 Sept 53
41	53-194	EXHAUST CLAMPS, #5 AND #15 CYLINDERS	11 Sept 53
42	53-195	EXHAUST VALVE, NO.3 CYLINDER	11 Sept 53
43	53-198	PESCO VACUUM PUMP DRIVE SHAFT	11 Sept 53
44	53-199	PESCO VACUUM PUMP DRIVE SHAFT	11 Sept 53
45	53-205A	NO.2 ENGINE CLANGE AT MOFFETT FIELD	17 Sept 53
46	53-206	FRONT OIL SUMP BODY ASSEMBLY	18 Sept 53
47	53-213	MOD, FUEL INJECTION PUMP SYNCHRONIZING	24 Sept 53
48	53-214	TAIL PIPE EXTENSION EXHAUST OVER- TEMPERATURE SWITCH	29 Sept 53

ENCLOSURE (3)

ENCLOSURE (3)

LIST OF REPORTS OF UNSATISFACTORY OR DEFECTIVE MATERIAL

NO.	VA-1 RUDH REFERENCE	SUBJECT	DATE
49	53-218	DISTRIBUTOR, BLDIX	7 Oct. 53
50	53-220	SHIELD ASSEMBLY POWER RECOVERY TURBINE	8 Oct. 53
51	53-232	DRIVE SHAFT, PESCO VACUUM PUMP	23 Oct. 53
52	53-238	WING SKIN	29 Oct. 53
53	53-246	WEB, LEFT WING LEAR SPIN	30 Oct. 53
54	53-252	AUXILIARY OIL CELL ASSEMBLY	18 Nov. 53
55	53-255	EXCHANGER, HEAT SECONDARY	9 Nov. 53
56	53-257	SUPPORT BRACKET, HAMILTON STANDARD PROPELLER	6 Nov. 53
57	53-262	DRIVE SHAFT-PESCO VACUUM PUMP	13 Nov. 53
58	53-274	LEFT HANDLINE HEATER	20 Nov. 53
59	53-275	ACTUATOR SUPERCHARGER DUMP	18 Nov. 53
60	53-276	LEFT HANDLINE HEATER	20 Nov. 53
61	53-284	BLADE ASSEMBLIES, EXPANDER	8 Dec. 53
62	53-286	NOZZLE BOX, POWER RECOVERY TURBINE	24 Nov. 53
63	53-287	POWER RECOVERY TURBINE SHIELD ASSEMBLY, COOLING TANGENTIAL	27 Nov. 53
64	53-288	POWER RECOVERY TURBINE SHIELD ASSEMBLIES, COOLING TANGENTIAL	24 Nov. 53
65	53-293	POWER RECOVERY TURBINE SHIELD ASSEMBLIES, COOLING TANGENTIAL	1 Dec. 53
66	53-296	SHIELD TOWNSHIPER AND PROPELLER ANTI-ICING ASSEMBLY	4 Dec. 53
67	53-303	NOZZLE BOX, POWER RECOVERY TURBINE (STRADDLE SADDLE)	15 Dec. 53
68	53-316	DUCT ASSEMBLY SUPERCHARGER	14 Dec. 53
69	53-319	BLADE ASSEMBLIES	14 Dec. 53
70	53-354	HYDRAULIC SYSTEM CONTAMINATION	14 Dec. 53

COMPLETE SYNOPSIS AS TAKEN FROM 31/0630Z SURFACE MAP

SUMMARY OF WEATHER CONDITIONS OVER ROUTE AND ADJACENT TO ROUTE
31/0230Z TO 31/0730Z

SYNOPTIC SITUATION:

A complicated low was centered approximately 100 miles north of Anacosti Island with a secondary low just northeast of Moncton, Nova Scotia. A cold front from secondary low extended SSW to 40 degrees N 63 degrees W then to 30 degrees N 69 degrees W, then SW to Central Cuba. A trough lies approximately 250 miles behind this cold front oriented NE-SW or parallel to primary front.

A warm front extends SE from the primary low through Newfoundland and then south to 40 degrees N 58 degrees W then SE to 35 degrees N 46 degrees W.

A low at 40 degrees N 41 Degrees W with a trough NNE and a cold front SSW. Warm front SE from low to 31 degrees N 30 degrees W. Low moving NNE at 10-15 MPH.

A 1038 MB high centered at 46 degrees N 36 degrees W.

WEATHER: NAS Pax River to 70 degrees was generally VFR with Scd to Brkn clouds at 4-5000 feet, tops 8-10000 ft. with scattered snow showers aloft and rain showers at surface near 70 degrees West.

70 degrees west and 50 degrees west along route or between 37degrees and 42 degrees north weather was generally IFR with fog, rain and low ceilings. Ceilings were variable 6-800 feet with clouds in layers to 15-16,000 feet, some buildups to 20,000 feet. Vis 1 to 2 miles in rain and fog; otherwise 8 to 10 miles.

Weather 50 degrees west to Lajes generally VFR. Partly cloudy to cloudy with ceilings 2-4000 feet, tops 8-10,000 feet except in Frontal Zone near 40 degrees N 41 degrees W where ceilings lowered to 500 feet in scattered squalls. Clouds layered 2-4000 feet, tops 8-10,000 feet, layer 10,000 to 12,000 feet tops 12-14,000 feet.

ICING: Light to moderate mixed Icing in clouds and precip. above freezing level. Freezing level sloped from 3000 feet at NHK to 7000 feet near 70 West, then to 10,000 feet at 58 degrees West and 12,000 feet at Lajes.

SUMMARY OF CONDITIONS AT PAX RIVER 31/0130Z TO 31/0630Z.

Overcast at 0130Z became broken cloudiness at 4500 feet then clearing by 0630Z. Visibility unrestricted. Surface winds were westerly at 8 to 15 knots.

Conditions NAS Pax River, NE along coast to Quonset Point and 150 miles east of Pax River were VFR with ceilings 4000 to 5000 feet in spots. (See attached sheets for actual weather conditions 31/0130Z to 31/0630Z)

Conditions along the coastal sections of France, Portugal and Africa 31/0030Z to 31/0630Z were generally VFR. A low was centered near 56 degrees N -- 18 degrees W with front southeast to 100 miles west of Brest, France, then SW to 43 degrees N and 20 degrees W. Scattered Rain showers accompanied front near Brest, but remainder of Africa should have been VFR.

(b) (6)

ENCLOSURE (2)

LCDR USN

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

FGC/rjk

AAR Board document in the aircraft accident involving R7V-1 Bureau Number 128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on or about 31 October 1954.

The following information was taken from the tape recording of the transmissions between the NAS tower and Navy 128441 on the 30th October 1954, and is certified to be a true transcript.

At 2127 the following clearance was delivered to Navy 128441.

"ATC clears Navy 8441 to the Lajes airport via direct Salisbury direct Shad, Great Circle route to Lajes, to cross Salisbury at 9000, maintain 9000. Contact Salisbury radio for further clearance. Read back please."

Navy 8441 reported this clearance correctly.

The tower then advised 8441 of the following:

"Navy 8441 ATC advises Salisbury may give you a higher altitude crossing Salisbury."

Navy 8441 rogered for this transmission.

At approximately 2138 the tower called Navy 8441 as follows:

"Navy 8441 I have an amendment to your clearance, are you ready to copy?"

Navy 8441 rogered.

"ATC clears 8441 to climb to and maintain one seven thousand one seven thousand.

The recorder did not pick up an answer from 8441.

The tower then transmitted: "Rober 8441 cleared for take-off, winds west 18"

8441 was stamped off the ground at 2139.

Upon take-off 8441 transmitted the following:

"Off your station at 40, Salisbury 55, climbing to seventeen thousand."

Certified to be a true copy.

(b) (6)

(b) (6)

ICDR, USN

ENCLOSURE (30)

AIR TRANSPORT SQUADRON ONE
U.S. NAVAL AIR STATION
PATUXENT RIVER, MARYLAND

FGC/rjk

AAR Board document in the aircraft accident involving R7V-1 Bureau Number
128441 piloted by LT John G. LEONARD, (b) (6) USN, which occurred on
or about 31 October 1954.

Statement of (b) (6) ADC concerning the release of 8441.

On October 29, 1954 I came on graveyard shift at 2345. As I was getting information concerning the aircraft to be worked on, word was passed to me that 128441 had been on a test hop, and that we had to work off test hop discrepancies. At that time an electrician came in and turned in the last work order sheet. I was told that all it needed was a gas lead and release. It was parked in front of the hangar, so I looked it over from the outside for loose inspection plates, gas leaks, and loose air-locks, and when I received a gas chit I released it from test hop discrepancies. When I released it I checked the log to be sure all discrepancies were written off in the log, and turned the log over to the E.W.O. chief who also checked the log to be sure it was cleared. There was no "carry over safety of flight items noted".

(b) (6)

Certified to be a true copy.

(b) (6)

(b) (6)

ICDR, USN

Enclosure (31)

Office Memorandum • UNITED STATES GOVERNMENT

TO : Op-30
 Via : Op-55
 FROM : Op-57

Op-574/ss
 DATE: 25 Jan 1955

*See if you can
 find an
 R7V-1 (128441)
 and Oct, 1954*

SUBJECT: Report of Independent Investigation of Major Aircraft Accident
 involving R7V-1, BuNo 128441 on Oct 1954

Encl : (1) Three copies of subject report
 (2) Copy of Op-53 memo Op534D/ps ser 20P53 of 13 Jan 1955
 (3) Copy of ComAirLant ltr ser 14B/293 of 12 Jan 1955
 (4) Copy of ComAirPac ltr ser 30/653 of 15 Jan 1955

1. Enclosure (1) is forwarded for information and action deemed appropriate on the recommendation contained in paragraph 3.b. therein. Enclosures (2), (3) and (4) also relate to this recommendation and are forwarded for information.

2. It is requested that this office be informed of any action taken as a result of the subject report with an information copy to Op-53, as requested in paragraph 4 of enclosure (2).

JOHN P. ROBERT, JR.
 Captain, USN

Copy to:
 Op-53